

## CONTRIBUTIONS TOWARD A FLORA OF PANAMA<sup>1</sup>

### III. COLLECTIONS DURING THE SUMMER OF 1938, CHIEFLY BY R. E. WOODSON, JR., P. H. ALLEN, AND R. J. SEIBERT

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During the summer of 1938, from June 17 to August 20, a party consisting of R. E. Woodson, Jr., Paul H. Allen, and Russell J. Seibert was sent to Panama under the joint auspices of the Missouri Botanical Garden and the Arnold Arboretum of Harvard University. The purpose of the expedition was chiefly to recoup the losses sustained in a fire at the end of the previous summer's collecting trip.

As in previous years, numerous short trips into the interior were made from the Tropical Station of the Missouri Botanical Garden at Balboa, C.Z., now under direct control of the Canal Zone. The principal trips, however, were to the highlands on Chiriquí on the Pacific slope of the Volcán de Chiriquí, a favorite collecting locality since the days of Seemann and Warscewicz, and the lowlands about the Chiriquí Lagoon in Bocas del Toro, upon the Atlantic slope. A projected trip to Darién was necessarily postponed because of the illness of both Woodson and Seibert. This trip was taken later in the year by Allen, and will be reported in the next of this series.

Although it is still possible to make the trip to Chiriquí rather painfully by cattle boat, use of the airplane and the new Panamerican Highway has decided advantages. Regular flying service from Panama City to David, the capitol city of Chiriquí province, reduces the time between the two cities, from a day and a night via the lowing and odorous hulls of the Compañía de Navegaciones Chitreana, to a mere two hours.

<sup>1</sup> Issued November 30, 1929.

Air travel, however convenient, has its drawbacks for the botanist. Many miles of vegetation-covered wilderness is given an exasperatingly distant enchantment. And should he be a timid soul, the wilderness becomes forbidding indeed if a precipitant descent is contemplated. In 1935 Woodson and Seibert, together with Dr. George W. Martin, had a taste of such interest when the landing gear of their plane was wrecked at the very moment of take-off, on an improvised landing field at Llanos del Volcán, in Chiriquí. Safe landing at that time was made by the skill of Robert Marstrand, the pilot, who was killed on the same route later in the summer, flying headlong into the clouded summit of Cerro Trinidad.

Taking all such things into consideration, a light truck was purchased by Allen and converted into a cavernous conveyance for enough collecting and pressing materials for a month. On top of all the other paraphernalia a precarious garnish was made of a number of living ornamental plants potted in tin cans and intended for our good friend Mr. T. B. Mönniche at Boquete. The whole cargo, heaped high, was covered with water-proofed canvas, and we set upon our way.

The Panamanian section of the Panamerican Highway is known locally as the *Carretera Nacional*. The preceding summer we had made the approximately 300-mile trip from Panama City to David in an ancient, specially chartered *chiva* (a light bus, but in Spanish, appropriately, a goat). We found then that most of the western half of the road was either in the process of being blasted from solid rock or cut through jungle, and the whole trip required twenty-eight hours of continuous driving. When all other details of that trip vanish, the scientific occupants of the *chiva* will probably still remember how, during each of those twenty-eight hours, they took turns holding up the windshield with their feet for the expressed benefit of the Panameño driver, bounding over the *Carretera* in a most unnatural position.

This year, however, we not only rode in a  $\frac{3}{4}$ -ton truck provided with springs, but found to our delight that the road had been improved quite noticeably, enabling us to reach David

after only fourteen hours. Although the road had been much worked upon during the year's interval, the surrounding country was still unspoiled, and we were able to make numerous collections en route, including several novelties. Even from the road, for example, the bright orange flowers of *Tussacia Woodsonii* Morton, abounding in the low woods near Remedios, could be distinguished from the rather greenish yellow flowers of the common *T. Friedrichsthaliana*. So with a grinding of brakes and a tornado of dust, a new species was added to the interesting family Gesneriaceae. In the swampy jungles near the Río Fonseca the attention of any motoring botanist could scarcely miss the giant, scarlet-bracted canes of *Costus Lima* K.Sch., previously unknown from Panama. Not a hundred yards from the road we ate our lunch under a tree in which were twining *Fernaldia speciosissima* and *Prestonia remedium*, new species of Apocynaceous lianas.

Nightfall found us established at the cavernous Pension Italiana in David. Early the next morning we abandoned the truck and transferred our gear to the narrow-gage train for the trip to Boquete. The line is only about thirty miles long, but is at such a continuous grade from David, about 50 m. elevation, to Boquete, about 1000 m., that it appeared to be all the diminutive locomotive could possibly do to pull us thence in three hours.

The name Boquete is well deserved, for it means "The Bouquet." The town, of perhaps 1,000 inhabitants, is set at about the elevation of Cartago, in Costa Rica, and is favored with a climate that is almost ideal. With the Volcán de Chiriquí towering above, it lies in a deeply forested canyon of the tempestuous little Río Caldera. Nearly everyone in town has a luxuriant garden almost monotonously filled with blooming roses, lilies and delicious strawberries. Not far up the mountain slopes a native raspberry (*Rubus glaucus* Benth.) abounds, which is really superior to the best cultivated berries of the States. It is no wonder that Boquete is a favorite alike for vacationists from the Canal Zone and for nearly all botanists who visit Panama.

But the real attraction of Boquete is that it is not far from Finca Lérica, the remarkable establishment of Mr. T. B. Mönniche, nearly 300 m. higher upon the slope of the volcano. It is doubtful whether Mr. Mönniche and his charming wife themselves know how many pilgrims to Finca Lérica they welcome each year. Surely in Panama, if not in all Central America, there is not another finca where the coffee is more successfully grown and handled, where the native help is more kindly and wisely administered, and where the proprietors are more gracious to all with whom they come in contact.

Mr. Mönniche is a keen naturalist himself, and fully understood our needs in studying the local vegetation. Accordingly, as in the previous summer, he placed at our disposal a little maintenance shed, "Casita Alta," about three miles farther up the slope of the volcano, at an elevation of about 2,000 m. Casita Alta furnishes the greatest requirement of a visiting plant collector, particularly in the rainy season: it is dry. Otherwise, it is a frame structure of about ten by eight feet, without windows, floor or furniture except a shelf in the back for our supplies. A bed is made by pulling fronds of the abundant *Pteris podophylla* Sw. (*sensu lato*), and making a mat on the dusty floor for sleeping-bags. Fire-making and cooking, as well as the drying of specimens, must be done out of doors.

We found Casita Alta exactly as we had left it at the end of the preceding summer, even to the sprig of mistletoe hung over the door like the sword of Damocles. Immediately after unpacking our belongings that Mr. Mönniche thoughtfully had had packed up the mountain side for us by mule-train we set about the construction of a "pressing room," or rather, a canvas shelter for our press-frames. During the rainy season, at least, artificial heat is necessary for drying in the tropics. After experiments over several collecting seasons, we have found that the one-unit, pressure kerosene stoves of Swedish make are by far the hottest, safest, and most economical.

It would be difficult to find a site more attractive to the botanical collector than that of Casita Alta, since it is located within easy reach not only of the deep valley of the Río Caldera

AN ALPINE MEADOW NEAR THE SUMMIT OF VOLCAN DE CHIRIQUÍ





THE CAMP AT CASITA ALTA, SUMMER OF 1937

headwaters, but of the higher slopes of the volcano itself. We soon found that it was a good arrangement for two of the party to go fairly far afield, leaving the third to tend the kerosene stoves. Incidentally, the one left could collect in the immediate vicinity of the camp, where much of interest was to be found, including the gigantic *Piper Gigas* Trelease, a tree 10 m. tall with a bole 30 cm. in diameter. Another very distinct pepper of similar height but more slender bole is *P. affectans* Trelease, also in this immediate vicinity. A rather rare borage, *Hackelia costaricensis* (Brand) Johnston, was so common in the immediate clearing around camp that it appeared to be an introduced weed.

After about three weeks of collecting from Casita Alta, including a trip to the summit of the volcano, we packed up our sundries, and descended to Boquete, paying our respects, en route, to the Mönniches, through whose kindness we had had such a delightful and profitable visit. The region about Boquete, aside from the Canal Zone, is probably the best known botanically of Panama. Nevertheless, things were made so convenient for us at "El Hotel Nuevo" that we could not forego a few days of foray, which resulted in the discovery of several interesting species.

Back in the Canal Zone again, several trips were made toward Chepo, to the east, and Arraiján, just over the boundary to the west. A visit of several days was made to the island of Taboga, in Panama Bay. Although the island has been a favorite resort from the mainland since the days of Spanish domination, and has been visited probably by every botanist to collect on the isthmus, a number of additions were made to the flora of Panama, including the antillean *Forsteronia spicata* (Jacq.) Meyer, which grows in veritable thickets along the northern shore.

The last two weeks of collecting were spent by Woodson in the neighborhood of Almirante, Bocas del Toro province, for a foray at the kind invitation of Dr. Wilson Popenoe and the United Fruit Company. The Atlantic slope of Panama is more poorly known botanically than the Pacific, and this port had

been selected because bi-monthly sailings are made to it from Cristobal by the ships of the Fruit Company.

The trip to Almirante was made with some misgivings, since the place has a rather evil reputation in the Canal Zone as a disease-infested shambles of abandonment caused by the plague of the Panama Disease of bananas. It is quite true that the disease has almost completely wiped out the traffic in bananas at Almirante, but the growing and processing of cocoa and abacá is progressing under very efficient management, and will doubtless restore the importance of the port.

Almirante itself is far from a shambles. The town is neatly maintained, and the people, all employees of the Fruit Company and their families, are the most uniformly co-operative one could wish. It is to Mr. John S. Kelley, the manager of the Almirante Division, and his wife, that we chiefly owe the success and pleasure of our collecting in the neighborhood of Almirante, for it was in their home that we made our headquarters. It is largely due to their hospitality that the impedimenta of pressing supplies were conveniently stored away for use, a safe shelter for the presses and kerosene stoves provided, and arrangements made for trips into the surrounding country. From the manner that every need or wish was anticipated, the visiting botanist would seem constantly to have been rubbing the magic lamp of Aladdin.

At the various Fruit Company plantations, appropriately yet unexpectedly, trained and discerning naturalists were much in evidence. Dr. Cordes and Mr. Arnold both are enthusiastic amateur botanists, and both have fine collections of living orchids. At Nievecito, in the valley of the Río Sixaola, we were most fortunate to have Mr. H. J. Bartlet not only as host, but as a guide and companion in the field. Merely following Mr. Bartlet upon his daily travels about the plantation was reward enough for a visit to Panama, because of his activity, understanding, and knowledge of the native vegetation. It was almost in Mr. Bartlet's "front yard" that a very unusual cucurbit was found which it has not been possible to refer satisfactorily to a genus. A most stimulating visit was made



to Mr. J. H. Permar, near Guabito, in the valley of Río Changuinola. We had long been anxious to meet Mr. Permar, since Dr. Popenoe had commented to me, at several times, on his understanding of tropical natural history. Upon his plantation of abacá Mr. Permar has established a small botanical garden of economic plants suitable for cultivation in the tropics of both hemispheres.

Perhaps the most interesting of the trips taken out from Almirante was that arranged for us by Mr. Kelley to the Río Cricamola at the east end of the Chiriquí Lagoon. Leaving Almirante one morning at about four o'clock, we stopped at the town of Bocas del Toro to pick up Mr. H. Wedel, a local ornithologist and accomplished photographer, who was to act as guide and interpreter. Proceeding thence by the United Fruit Company's Diesel-powered yacht "Talamanca," we arrived at the bar of the Río Cricamola shortly before noon. From the bar, we ascended the river in two long *cayucas*, or dug-out canoes, piled high with every convenience which the Fruit Company could provide, including the precaution of six cages of carrier pigeons for communication to Almirante.

We made our headquarters for the several days of our visit, at a ruined plantation called "Finca St. Louis," not far downstream from the Indian village known as Konkintoë. Once an elaborate establishment, the ill-starred Finca St. Louis is a rambling frame building of two stories in a most dismal state of decay. Nothing now remains of the plantings, the lowland jungle pressing close upon every side, as only such tropical second growth can. Upon the rotting fence-posts was found good collecting of many epiphytes ordinarily growing high in trees. Amongst these were some interesting novelties and new records in Orchidaceae and Gesneriaceae. In the half-submerged borders of the river a good representation of Marantaceae, Zingiberaceae, and Araceae was collected. And with the aid of Martin Sparks, a young Bocatoreño who had accompanied us in a duplex rôle of butler and scientific technician, a fair sample was taken of all available flowering and fruiting trees.

After returning again to the comparative luxury of Bocas del Toro, we accepted the hospitality of Mr. Wedel for a collecting trip upon Isla de Colón, where the town of Bocas del Toro is situated. With only a short time at our disposal, scarcely a decent start could be made in the botanical exploration of this interesting and accessible district. But, thanks to the kindly experience of Mr. Wedel, in only a few days numerous additions were made to the known flora of Panama, here very similar to that of Atlantic coastal Costa Rica. There is probably no one in the vicinity of the Chiriquí Lagoon who is quite so familiar with the country and its inhabitants as Mr. Wedel. Since last spring, he has started independently collecting, sending his specimens to the Missouri Botanical Garden for identification and distribution.

## LYCOPODIACEAE

(William R. Maxon, Washington, D. C.)

LYCOPODIUM ERYTHRAEUM Spring—CHIRIQUÍ: Loma Larga to summit, Volcán de Chiriquí, alt. ca. 3000 m., July 5, 1938, Woodson, Allen & Seibert 1079. Previously known only from Ecuador, Peru, and Bolivia. It almost certainly occurs in Colombia as well.

## ISOETACEAE

(W. R. Maxon and C. V. Morton, Washington)

ISOETES **panamensis** Maxon & Morton, sp. nov. Sect. *Tuberculatae*. Planta aquatica; rhizoma trilobatum grossum, ca. 3 cm. latum; folia rigida, ca. 50, ca. 32 cm. longa, 2 mm. medio lata, apice acuminata, basi valde dilatata (margine hyalina ca. 8 cm. longa, basi 5–6 mm. lata utroque latere), valde triquetra, septis transversis numerosis perspicuis, stomatibus numerosis, fasciculis fibrovascularibus periphericis validis 6; ligula deltoidea, ca. 3.5 mm. longa, 5 mm. basi lata, acuta; velum nullum; sporangia magna, ambitu elliptica, ca. 13 mm. longa, 6–7 mm. lata; macrospora albae, 350–500  $\mu$  diam., valide ubique tuberculatae, tuberculis non confluentibus, magnis, elongatis (saepe 25  $\mu$  longis), apice rotundatis, costis commissuralibus perspicuis; microspora parvae, ca. 25  $\mu$  diam., laeves.—PANAMÁ: pond, vicinity of Bejuco, Aug. 7, 1938.

*Woodson, Allen & Seibert 1685* (U. S. Nat. Herb. no. 1,748,502, TYPE).

In Dr. Pfeiffer's monograph the present species seems to be nearest *Isoetes Malinverniana* Cesati & De Not. of Italy. Specimens collected by Cesati and Malinverni and others, kindly lent by the New York Botanical Garden and the Gray Herbarium, show that species to differ in having the ligule lanceolate, the macrospores larger (660–900  $\mu$ ), and the microspores roughened. *Isoetes cubana* Engelm., of Cuba and British Honduras (?), is a laxer and more slender plant, with macrospores bearing low rounded tubercles. *I. Gardneriana* A. Br. of Brazil is similar in habit, but the macrospores are dark brown and bear fine tubercles.

In the treatment by U. Weber<sup>1</sup> *I. panamensis* would fall in the section *Amphibiae* near *I. Gardneriana* and *I. triangula* Weber. The latter is represented in the U. S. National Herbarium by a specimen of the type collection (*Ule 8000*, from Río Branco, Amazonas, Brazil). It is distinguished from *I. panamensis* by the bilobed rhizome and the small sporangia (5 mm. long).

No species of *Isoetes* has previously been known from Panama, and only one species has been found in adjacent Central America, namely, *I. Storkii* T. C. Palmer, of the mountains of Costa Rica. *Isoetes panamensis* is a lowland species growing near sea level.

#### HYMENOPHYLLACEAE

(William R. Maxon, Washington, D. C.)

TRICHOMANES ANKERSII Hook. & Grev.—BOCAS DEL TORO: fronds thickly "plastered" to tree trunk, Isla de Colón, alt. ca. 25–75 m., Aug. 18, 1938, *Woodson, Allen & Seibert 1933*. Previously known from Costa Rica, and from Colombia to Bolivia.

#### POLYPODIACEAE

(William R. Maxon, Washington, D. C.)

DIPLAZIUM LINDBERGII (Mett.) Christ.—BOCAS DEL TORO: vicinity of Nievecito, alt. ca. 15 m., Aug. 8, 1938, *Woodson, Allen*

<sup>1</sup> U. Weber, "Zur Anatomie und Systematik der Gattung *Isoetes* L.," *Hedwigia* 63: 219–262. 1922.

& *Seibert 1801*. This species, newly recorded from Panama, was described from Brazil, and is reported from Mexico (perhaps in error), Colombia, and Venezuela. At the U.S. National Herbarium we have under this cover specimens ranging from Costa Rica to Colombia and Bolivia. The Panama plant agrees with the Costa Rican specimens, but this material may not be conspecific with the Brazilian type. As regarded at present it must be reckoned a polymorphic species.

ELAPHOGLOSSUM DOMBEYANUM (Fée) Moore—CHIRIQUÍ: steep cliffs of Potrero, near summit, Volcán de Chiriquí, alt. ca. 3300 m., July 5, 1938, *Woodson, Allen & Seibert 1048*. Known previously from Colombia, Venezuela, and Ecuador.

STRUTHIOPTERIS LOXENSIS (HBK.) Maxon—CHIRIQUÍ: Loma Larga to summit, Volcán de Chiriquí, alt. ca. 3000 m., July 5, 1938, *Woodson, Allen & Seibert 1067*. Specimens in the U.S. National Herb. are from Colombia, Ecuador, Peru, and Bolivia.

#### OPHIOGLOSSACEAE

(*R. T. Clausen, Ithaca, N. Y.*)

OPHIOGLOSSUM NUDICAULE L.f. var. TENERUM (Mettenius) Clausen—PANAMÁ: wet savanna, east of Pacora, June 19, 1938, *Woodson, Allen & Seibert 727*. The first record of this species from Central America.

#### CYPERACEAE

(*H. K. Svenson, Brooklyn, N. Y.*)

CAREX LEMANNIANA Boott—CHIRIQUÍ: common on potrero, forming dense tussocks, near summit, Volcán de Chiriquí, alt. ca. 3300 m., July 4–6, 1938, *Woodson, Allen & Seibert 1057*. Reported by Standley (*Fl. Costa Rica 1: 96. 1937*) as occurring from Costa Rica to Ecuador at altitudes above 2000 m., but apparently never before collected in Panama.

CYPERUS ALBOMARGINATUS Mart. & Schrad.—CANAL ZONE: near Fort Kobe road, July 22, 1938, *Woodson, Allen & Seibert 1427*. Not previously reported from Panama. This number is very peculiar in its light scales; all other material examined from Mexico and Central America has ferruginous scales.

*RYNCHOSPORA TRIFLORA* Vahl—PANAMÁ: boggy grasslands and marginal thickets between Pacora and Chepo, Aug. 1, 1938, *Woodson, Allen & Seibert 1663*. A widespread tropical species not reported from Central America.

## BROMELIACEAE

(*L. B. Smith, Cambridge, Mass.*)

*TILLANDSIA PUNCTULATA* Schlechtd. & Cham.—CHIRIQUÍ: vicinity of Casita Alta, Volcán de Chiriquí, alt. ca. 1500–2000 m., June 28–July 2, 1938, *Woodson, Allen & Seibert 991*. Previously known from southeastern Mexico to Costa Rica, and reported from Surinam.

*VRIESIA Woodsoniana* L. B. Smith, spec. nov. (pl. 20), acaulis; foliis rosulatis, ad 5 dm. longis, vaginis ellipticis, basi castaneis, dense punctato-lepidotis, laminis ligulatis, 3 cm. latis, apice rotundato-apiculatis, concoloribus, subtus minute denseque lepidotis, supra glabris; scapo erecto, glabro, vaginis foliaceis dense induto; inflorescentia simplicissima, curvata, subdense pauciflora, ca. 15 cm. longa; bracteis florigeris imbricatis, paulo secunde versis, latissime ovatis, ad apicem versus triangulo-acutis, ad 45 mm. longis et 33 mm. latis, quam sepala longioribus, glabris, valde rugosis, nullo modo carinatis, basi atro-castaneis; floribus valde secundis; pedicellis 1 cm. longis, valde incrassatis; sepalis late ovatis, acutis, 35–40 mm. longis, subtenuibus, impresso-puncticulatis; petalis imperfecte cognitis, basi ligulis binis ad 1 cm. longis auctis; staminibus verisimiliter inclusis.—CHIRIQUÍ: Bajo Mona, mouth of Quebrada Chiquero, along Río Caldera, alt. ca. 1500–2000 m., July 3, 1938, *Woodson, Allen & Seibert 1029* (Herb. Missouri Bot. Garden, TYPE; Gray Herb., photograph and analytical drawings). In its combination of rugose floral bracts and secund flowers, *Vriesia Woodsoniana* is quite unlike any previously known species.

## JUNCACEAE

*LUZULA GIGANTEA* Desv. var. *vulcanica* Woodson, var. nov., a var. typ. differt foliis angustioribus (0.7–0.9 cm. latis) margine longiuscule denseque ciliatis; tepalis saturate castaneis apice

vix mucronulatis.—CHIRIQUÍ: "El Potrero," Volcán de Chiriquí, alt. ca. 3380 m., July 4–6, 1938, *Woodson, Allen & Seibert 1094* (Herb. Missouri Bot. Garden, TYPE). This is apparently the first record of the species from Panama. Only the forbidding technical difficulties of the genus prevent me from describing var. *vulcanica* as a species, so different does it appear, especially in the foliage, from material that I have seen from Mexico and Costa Rica, and from published plates from South American plants. It forms extensive colonies on the volcanic floor of "El Potrero," immediately beneath the peak of the Volcán de Chiriquí.

## MUSACEAE

*HELICONIA nutans* Woodson, spec. nov. (Sect. *Taeniostrobus* O.Ktze.). Herba valida ca. 2-metralis. Folia longe petiolata, petioli 25–30 cm. longi subteretes longitudinaliter striati ca. 0.3 cm. crassi, vagina 20 cm. longa ore membranacea purpurissata, lamina oblongo-elliptica apice abrupte acuminata basi late cordata apice obtusa usque 60 cm. longa 24 cm. lata superne minora utrinque viridis glabra. Inflorescentia longe pedunculata, pedunculo 20–32 cm. longo graciliusculo erecto glabro, rhachi nutanti flexuoso-curvato 15–25 cm. longo ca. 0.4 cm. diam. dense ferrugineo-tomentoso, bracteis 4–7 ambitu lanceolatis latiuscule cymbiformibus apice longe acuminatis basi subamplexicaulibus 6–13 cm. longis 2.0–2.5 cm. latis carinatis rubidulis margine extus minute ferrugineo-hirtellis caeterumque glabris, bracteolis ovatis acuminatis 2–4 cm. longis papyraceis nervo medio ferrugineo-hirtellis caeterumque glabris. Flores in bractearum axillis ca. 4–7, pedicellis ca. 0.2 cm. longis sparse pilosulis, ovario clavato ca. 0.6 cm. longo apice ca. 0.25 cm. crasso glabro, tepalis anguste lanceolatis acuminatis ca. 4.7 cm. longis paulo arcuatis aurantiacis extus margine pilosulis intus omnino pilosulis, staminibus 5, filamentis 5 cm. longis tomentellis, antheris haud visis, staminodio vix 0.3 cm. longo, stylo 5 cm. longo glabro. Capsula ovoidea 1 cm. longa 0.8 cm. crassa glabra atro-violacea.—CHIRIQUÍ: vicinity of Casita Alta, Volcán de Chiriquí, alt. 1500–2000 m., June 28–July 2, 1938, *Woodson, Allen & Seibert 968* (Herb. Missouri Bot. Garden, TYPE).

Apparently most closely related to *H. marginata*, of Darién province, Panama, but differing in the cordate leaves and smaller inflorescence, as well as in technical details of the flowers.

ZINGIBERACEAE

**COSTUS LIMA** K.Sch.—CHIRIQUÍ: moist valley thickets, west of Remedios, June 24, 1938, *Woodson, Allen & Seibert 786*; BOCAS DEL TORO: vicinity of Nievecita, alt. 0–50 m., Aug. 8–19, 1938, *Woodson, Allen & Seibert 1835*. This magnificent species with dark crimson, leafy bracts, which was previously considered as endemic to Costa Rica, was found in numerous localities at low elevations upon both coasts of Panama in Chiriquí and Bocas del Toro. One variation of the species from the latter province, which is distinguished well by its pale pink or flesh-colored bracts, may be described as follows:

**COSTUS LIMA** K.Sch. var. **Wedelianus** Woodson, var. nov., ab var. typ. bracteis obtusiusculis brevioribus carneisque differt.—BOCAS DEL TORO: Río Cricamola, between Finca St. Louis and Konkintoë, alt. ca. 10–50 m., Aug. 12–16, 1938, *Woodson, Allen & Seibert 1926* (Herb. Missouri Bot. Garden, TYPE). This variety, which may well merit specific rank, is named in honor of Mr. H. Wedel, the ornithologist of the city of Bocas del Toro, to whom we owe much aid during the trip up the Cricamola River and elsewhere in Bocas del Toro.

**COSTUS ARGENTEUS** R. & P.—PANAMÁ: thickets and forests near Arraiján, alt. ca. 15 m., July 21, 1938, *Woodson, Allen & Seibert 1358*; CHIRIQUÍ: thickets west of Remedios, June 24, 1938, *Woodson, Allen & Seibert 789*. Considerable confusion has surrounded the identity of this magnificent species, which is common in midsummer in the Canal Zone and occurs elsewhere in the Republic upon both coasts, especially the Pacific. Recorded distribution of *C. argenteus* has been confined to western Peru and Ecuador. All the collections of the species that I have seen have been assigned to *C. villosissimus* Jacq., a very different and common plant of smaller stature and covered everywhere save the flower itself with a long, yellow-hirsute indument. Plate 14 in Standley's "Flora of the Panama

Canal Zone," represents *C. argenteus* rather than *C. villosissimus*. The two species, occurring so commonly together, present strong evidence of hybridization. *Seibert 593*, collected in the vicinity of Gold Creek, near Gamboa, Canal Zone, and distributed as *C. villosissimus*, is a striking example of the putative hybrids.

Recently I have had the good fortune, through the kindness of Professor Domin, of examining the type of *C. hirsutus* Presl (*Haenke s.n.* in Herb. Mus. Nat. Prag.). The specimen appears to me quite conspecific with those more correctly referred to *C. villosissimus* Jacq.

RENEALMIA EXALTATA L.f.—BOCAS DEL TORO: Río Cricamola, between Finca St. Louis and Konkintoë, alt. ca. 10–50 m., Aug. 12–16, 1938, *Woodson, Allen & Seibert 1905*. It is almost incredible that this common and widespread species of the Caribbean and northeastern South America has not previously been reported for Panama. Neither have I seen herbarium specimens from the republic. It is not uncommon in the lowlands bordering the Río Cricamola, and probably is to be found elsewhere along the Atlantic coast.

#### MARANTACEAE

*CALATHEA quadratispica* Woodson, spec. nov. Planta valida 2–3 m. alta. Folia longissime petiolata, petioli pars superior paulo compressa callosa 15–17 cm. longa glabra vel minutissime sparseque papillosa pars inferior ca. 75–95 cm. longa, lamina inaequilateraliter ovata basi late obtusa apice rotundata 80–95 cm. longa 47–50 cm. lata utrinque viridis inferne paulo pallidior durius herbacea margine minute puberula caeterumque glabra, vagina scariacea 25–26 cm. longa margine minute puberula. Spicae 2 quadrato-cylindricae 14–15 cm. longae ca. 3 cm. diam., pedunculo 25–30 cm. longo apice dense puberulo in vagina incluso; bractee distichae 30–34 dense imbricatae latissime ovatae vel suborbiculatae apice rotundatae vel paululo retusae margine vulgo plus minusve revolutae ad 3 cm. longae sparse minuteque pilosulae superne apicem versus densius scariaceae aureae 6–8-florae; paria



florum brevissime (ca. 0.1 cm. vel minus) pedicellatorum 8–12 bracteolis scariaceis exterioribus ca. 2.5 cm. longis ca. 1.2 cm. latis latissime oblongis valde conduplicatis apice truncatis haud profunde 2–4-lobatis interioribus multo minoribus oblongo-lanceolatis acuminatis; ovarium ca. 0.3 cm. longum glabrum vel minute papillatum; sepala oblonga late obtusa 1.7–1.8 cm. longa glabra; corollae flavae tubus anguste cyathocylindricus 2.8–3.0 cm. longus basi ca. 0.07 cm. diam., ostio ca. 0.125 cm. diam., lobi ovato-lanceolati acuti ca. 0.8 cm. longi, stamen paululo exsertum 0.3 cm. longum compresse ellipsoideum, staminodium exterius oblique obovatum flavum 1.1 cm. longum, callosum brevius cucullatum 0.7 cm. longum; capsula non visa.—BOCAS DEL TORO: swampy margins of Río Cricamola, between Finca St. Louis and Konkintoë, Aug. 12–16, 1938, Woodson, Allen & Seibert 1913 (Herb. Missouri Bot. Garden, TYPE). When first studied, this species was thought possibly to represent *C. sclerobractea* K.Sch., which is known to occur only in Guatemala. From the latter, however, and from all other species known to me, *C. quadratispica* differs quite obviously in the rather strongly quadrate-compressed spikes. It is not uncommon in the valley of the Río Cricamola, where it occurs with the familiar *C. lutea* and *C. insignis*.

## ORCHIDACEAE

(L. O. Williams, Cambridge, Mass.)

*PHRAGMIPEDIUM CAUDATUM* (Lindl.) Rolfe, in Orch. Rev. **4**: 332. 1896; Pfitzer, in Engl. Pflanzenr. **IV**. 50 (Heft 12): 52. 1903, in synonym.—*Cypripedium caudatum* Lindl., Gen. & Sp. Orch. Pl. 531. 1840; *Selinipedium caudatum* Rchb.f., in Bonplandia **2**: 116. 1854; *Paphiopedilum caudatum* Pfitzer, in Engl. Bot. Jahrb. **19**: 41. 1894; *Paphiopedilum caudatum* Kerch., Orch. 454. 1894.—CHIRIQUÍ: vicinity of Casita Alta, alt. 1500–2000 m., June 28–July 2, 1938, Woodson, Allen & Seibert 962.

*Phragmipedium caudatum* has been reported from Chiriquí by Reichenbach (Beitr. Orch. Centr.-Am. 44. 1867), but no specimen was cited by him. The specimen cited above would

seem to be the second collection from Panama. The species is known in Costa Rica, Colombia, Ecuador, and Peru.

The original spelling of the generic name was *Phragmipedium*. Pfitzer changed the spelling to *Phragmopedilum*, in his treatment of the group, and accredited all the combinations to Rolfe except one.<sup>1</sup> This change of the spelling of the generic name is not permissible.

HABENARIA HEPTADACTYLA Rehb.f., in *Linnaea* **22**: 812. 1849.—PANAMÁ: terrestrial, thickets and forests near Arraiján, alt. about 15 m., July 21, 1938, *Woodson, Allen & Seibert 1406*; without definite locality (Canal Zone or Panama Province), *A. M. Bouché, Jr. 7*.

*Habenaria heptadactyla* does not seem to have been reported from Panama previously. It is known to occur in Venezuela, British Guiana, and Brazil.

HABENARIA PAUCIFLORA (Lindl.) Rehb.f., in *Bonplandia* **2**: 10. 1854.—*Habenaria setifera* Lindl., in *Ann. Nat. Hist.* **4**: 381. 1840.—PANAMÁ: boggy grasslands and marginal thickets, between Pacora and Chepo, alt. about 25 m., Aug. 1, 1938, *Woodson, Allen & Seibert 1665*.

Previously reported from Chiriquí as *H. setifera* by Schweinfurth (*Ann. Mo. Bot. Gard.* **24**: 182. 1937). This species ranges from Mexico to Argentina.

PONTHIEVA EPHIPIUM Rehb.f., in *Linnaea* **28**: 382. 1856.—CHIRIQUÍ: terrestrial, Finca Lérida to Boquete, alt. 1300–1700 m., July 8–10, 1938, *Woodson, Allen & Seibert 1118*.

New to Panama and Central America. Not previously recorded south of the state of Puebla in Mexico.

*Ponthieva Ehiphium* is very closely allied to *P. racemosa* (Walt.) Mohr, but has a lip with two small calluses at the base of the blade and is usually a smaller plant with smaller flowers.

PLEUROTHALLIS VITTATA Lindl., in *Bot. Reg.* **24**: Misc. 73. 1838; *Fol. Orch. Pleurothallis*, 18. 1859.—*Pleurothallis poly-*

<sup>1</sup> PHRAGMIPEDIUM *Hartwegii* (Rehb.f.) L. O. Williams, comb. nov.—*Cypripedium Hartwegii* Rehb.f., in *Bot. Zeit.* **10**: 714. 765. 1852; *Selinipedium Hartwegii* Rehb.f., in *Bonplandia* **2**: 116. 1854; *Xen. Orch.* **1**: 3, 70. t.27. 1854; *Phragmopedilum Hartwegii* Pfitzer, in *Engl. Pflanzenr.* **IV**. 50 (Heft 12): 48. 1903.

*stachya* Rich. & Gal., in Ann. Sci. Nat. III, 3: 16. 1845; *Pleurothallis mandibularis* Kränzl., in Vid. Medd. Naturh. Foren. 71: 169. 1920; *Pleurothallis Bourgeaui* Kränzl., in Ark. f. Bot. 16<sup>s</sup>: 15. 1920.—COCLÉ: epiphytic, between Las Margaritas and El Valle, July 15–Aug. 8, 1938, *Woodson, Allen & Seibert 1282*.

*Pleurothallis vittata* is new to the flora of Panama. Previously it has been known from Mexico and Honduras and was reported from Venezuela by Lindley. The record for Venezuela cannot be verified here, as the specimen on which the record was based (*Fendler 1481*) is lacking from the Fendler collection at the Gray Herbarium.

MALAXIS MAJANTHEMIFOLIA Schltr. & Cham., in Linnaea 6: 59. 1831.—CHIRIQUÍ: terrestrial, vic. of Casita Alta, Volcán de Chiriquí, alt. 1500–2000 m., June 28–July 2, 1938, *Woodson, Allen & Seibert 830*.

*Malaxis Majanthemifolia* is new to the flora of Panama. The species was previously recorded from Mexico, Honduras, and Guatemala. The flowers of the Panamanian collection are somewhat unusual in that the lateral sepals are adnate almost to their tips.

MALAXIS PARTHONII Morren, in Bull. Acad. Roy. Belg. 5: 485, t. 1838.—CHIRIQUÍ: terrestrial, Finca Lérída to Boquete, alt. 1300–1700 m., July 8–10, 1938, *Woodson, Allen & Seibert 1172*; CANAL ZONE: terrestrial, vic. of Salamanca Hydrographic Station, Río Pequení, alt. about 80 m., July 28–29, 1938, *Woodson, Allen & Seibert 1581*.

*Malaxis Parthonii* seems not to be recorded from Panama although it is known from Mexico to Costa Rica and again in northern South America.

MALAXIS **Woodsonii** L. O. Williams, sp. nov. (pl. 21, figs. 1–2). Herba nana, terrestris. Caulis brevis, inferne bulbosus, supra medium bifoliatus. Folia subaequalia, late ovata. Inflorescentia subumbelliformis. Segmenta perianthii patentia. Sepala late lanceolata, obtusa. Petala filiformia. Labellum quadratum, apice trilobatum; auriculae lineari-lanceolatae, acutae. Columna minuta.

Small terrestrial herbs up to about 15 cm. tall. Stems short,

swollen and pseudobulbous below, covered with the sheathing petioles of the leaves and by basal bracts. Leaves two, subequal, broadly ovate, obtuse or acute, 1.5–5.5 cm. long and 1.3–4.5 cm. broad, appearing sessile and to be borne well above the middle of the stem but actually with a long petiole which sheathes the stem, margin of the blade crenulate or obscurely serrate, several-nerved. Inflorescence many-flowered; floral bracts short, lanceolate, scarious; pedicels erect or spreading, about 1 cm. long. Sepals broadly lanceolate, obtuse, obscurely 3-nerved, 2.5–4 mm. long and 1.5–2.5 mm. broad, margins strongly recurved, especially on the dorsal sepal. Petals filiform, about 2.5–3 mm. long. Lip quadrate in outline, about 3.5–5 mm. long and 3–3.5 mm. broad; apex of the lip 3-lobed, mid-lobe small, exceeded by the lateral lobes in length, lateral lobes large, rounded, obtuse; the basal auricles linear-lanceolate, acute, 1–2 mm. long, parallel to the axis of the lip, arising well up from the base of the lip; disk with two shallow cavities extending from the base of the column. Column short, about 1 mm. long.—CHIRIQUÍ: terrestrial, vic. of Casita Alta, Volcán de Chiriquí, alt. about 1500–2000 m., June 28–July 2, 1938, *Woodson, Allen & Seibert 831 and 832* (Herb. Ames, Cambridge, Mass., No. 55,715, TYPE).

*Malaxis Woodsonii* is distinguished from all other American species by the position of the basal auricles of the lip as well as by less obvious characters.

LIPARIS ELATA Lindl., in Bot. Reg. **14**: t. 1175. 1828.—CANAL ZONE: epiphytic, vic. of the Salamanca Hydrographic Station, Río Pequení, alt. about 80 m., July 28–29, 1938, *Woodson, Allen & Seibert 1580*.

Although *Liparis elata* does not seem to have been recorded from Panama previously it ranges from Florida, the West Indies, and Mexico, south to northern South America.

EPIDENDRUM **Boothii** (Lindl.) L. O. Williams, comb. nov.—*Maxillaria Boothii* Lindl., in Bot. Reg. **24**: Misc. 52. 1838; *Dinema paleaceum* Lindl., in Bot. Reg. **26**: Misc. 51. 1840; *Epidendrum auritum* Lindl., in Bot. Reg. **29**: Misc. 4. 1843; *Epi-*

*dendrum Lindenianum* Rich. & Gal., in Ann. Sci. Nat. III, 3: 20. 1845; *Epidendrum paleaceum* Rchb.f., Beitr. Orch. Centr.-Am. 80. 1860; in Saunders' Ref. Bot. 2: t. 87. 1869; Ames, Hubbard & Schweinf., Genus Epidendrum in U. S. & Mid. Am. 140. 1936; *Nidema Boothii* Schltr., in Fedde Repert. Beih. 17: 43. 1922.—BOCAS DEL TORO: epiphytic, Río Cricamola, between Finca St. Louis and Konkintoë, alt. about 10–50 m., Aug. 12–16, 1938, Woodson, Allen & Seibert 1892.

*Epidendrum Boothii* is new to the flora of Panama, although it was known in Mexico, throughout Central America except Panama, Cuba, Venezuela and Dutch Guiana.

Ames, Hubbard and Schweinfurth, in their study of *Epidendrum*, did not take up *Maxillaria Boothii*, which is the oldest name for the species, because they supposed that *Epidendrum Boothianum* Lindl. would make a homonym of the combination *Epidendrum Boothii*. This, however, is not the case as *Epidendrum Boothianum* is adjectival in form while *Epidendrum Boothii* is genitive (cf. International Rules of Botanical Nomenclature, ed. 1935, Art. 70, note 4).

EPIDENDRUM ISOMERUM Schltr., in Fedde Repert. 2: 132. 1906.—BOCAS DEL TORO: epiphytic, pendulous in dense clumps, Río Cricamola, between Finca St. Louis and Konkintoë, alt. about 10–50 m., Aug. 12–16, 1938, Woodson, Allen & Seibert 1886.

*Epidendrum isomerum* does not seem to have been previously reported from Panama, although there is a fragment in the Ames Herbarium collected by G. S. Miller, Jr., near Río Medio in the Canal Zone. Previously recorded from Mexico, Guatemala, Honduras, and Costa Rica.

EPIDENDRUM PRISMATOCARPUM Rchb.f., in Bot. Zeit. 10: 729. 1852.—CHIRIQUÍ: on fallen logs, Finca Lérida to Boquete, alt. about 1300–1700 m., July 8–10, 1938, Woodson, Allen & Seibert 1117.

The type of *Epidendrum prismatocarpum* came from Chiriquí, but there is no record in the Ames Herbarium of the plant having been re-collected in Panama. The species is not uncommon in Costa Rica.

GALEANDRA BAUERI Lindl. in Bauer, Ill. Orch. Pl. Gen. *t.* 8. 1832 (?); Gen. & Sp. Orch. Pl. 187. 1833; in Bot. Reg. **26**: *t.* 49. 1840; Bateman, Orch. Mex. & Guat. *t.* 19. 1840.—*Galeandra Batemanii* Rolfe, in Gard. Chron. III, **12**: 431. 1892.—BOCAS DEL TORO: in swamp near Almirante, at sea-level, flowered in Panama Aug. 20, 1939, (comm. Paul H. Allen to) *Hugo Nash* 1962.

*Galeandra Baueri* is new to the flora of Panama. It has been recorded previously from Mexico, British Honduras, Guatemala, Honduras, and French Guiana.

Since Rolfe gave a new name to the Mexican plants in 1892, the name seems to have been universally adopted. Rolfe distinguished *G. Batemanii* as having "a short ovoid pseudobulb, and a dull purple lip" and *G. Baueri* as having "a slender fusiform pseudobulb, and a pale-coloured lip." Most of the Mexican and British Honduran material examined has slender pseudobulbs, but the shape seems to depend on age, the younger ones being slender, the older ones thicker. In regard to the coloration of the flowers it must be remembered that Bauer's drawings were made from a dried specimen which could have lost its color—as have most of the specimens in the Ames Herbarium.

WARREA COSTARICENSIS Schltr., in Fedde Repert. **16**: 446. 1920.—CHIRIQUÍ: terrestrial, deep shade near Potrerillos, 1939, *Allen s.n.*; locality lacking, alt. 3000 ft., 1938, *Kieswetter s.n.*

It is with some hesitation that the above plants are referred to Schlechter's species but it is perhaps best to place them here until the species is better known.

In the specimens cited the lip is oval to round and apparently not emarginate, while Schlechter described and drew the lip of *Warrea costaricensis* as oblong and emarginate. If Schlechter's drawings are correct, there are also differences in the stipe and the gland of the pollinia between the Panamanian plants and Schlechter's specimens, which were from Costa Rica.

GOVENIA CILIILABIA Ames & Schweinf., in Sched. Orch. 10: 80. 1930.—CHIRIQUÍ: vic. of Casita Alta, Volcán de Chiriquí, alt. about 1500–2000 m., June 28–July 2, 1938, *Woodson, Allen & Seibert 947*.

*Govenia ciliilabia* is the rarest species of the genus in Central America. The original and, until now, the only known specimen of the species was collected at Cola de Galla, Costa Rica.

MAXILLARIA RINGENS Rchb.f., in Walp. Ann. 6: 523. 1863; C. Schweinf., in Bot. Mus. Leaf. Harv. Univ. 4: 91. 1937.—CHIRIQUÍ: epiphytic, Bajo Mono, mouth of Quebrada Chiquera, along Río Caldera, alt. about 1500–2000 m., July 3, 1938, *Woodson, Allen & Seibert 1010*.

The collection cited above is rather unusual in the large size of the flowers, otherwise it would seem to be quite typical of the species. The sepals are from 5 to 6 cm. long, and the petals are about 4.5 cm. long.

Known previously from Panama; also from Guatemala, Nicaragua, and Costa Rica. The synonyms, *Maxillaria Rousseauae* Schlecht. and *M. pubilabia* Schlecht., were based on Panamanian material.

RODRIGUEZIA COMPACTA Schltr., in Fedde Repert. Beih. 19: 144. 1923.—BOCAS DEL TORO: epiphytic, Río Cricamola, between Finca St. Louis and Konkintoë, alt. about 10–15 m., Aug. 12–16, 1938, *Woodson, Allen & Seibert 1888*.

New to Panama. The specimen is past flower but there is little doubt concerning the identity of the plant. Previously recorded from Costa Rica.

OSMOGLOSSUM ANCEPS Schltr., in Fedde Repert. Beih. 19: 147. 1923.—CHIRIQUÍ: epiphytic, vic. of Casita Alta, Volcán de Chiriquí, alt. about 1500–2000 m., June 28–July 2, 1938, *Woodson, Allen & Seibert 875*.

Previously recorded only from Costa Rica.

ODONTOGLOSSUM OERSTEDII Rchb.f., in Bonplandia 3: 214. 1855; Xen. Orch. 1: 189, t. 68, I. 1856.—CHIRIQUÍ: epiphytic on dead logs in dense wet forest, Loma Larga to summit, Volcán de Chiriquí, July 4–6, 1938, *Woodson, Allen & Seibert 1030*.

A handsome small plant previously known only from Costa Rica.

*NOTYLIA Cordesii* L. O. Williams, sp. nov. (pl. 21, figs. 3-4). Herba epiphytica, parva. Folia aequantia, lineari-lanceolata vel lanceolata, acuta vel acuminata. Pseudobulbus parvus, complanatus, unifolius. Inflorescentia subumbellata; bracteae scariosae, lanceolatae, acutae vel acuminatae. Sepalum dorsale lineari-lanceolatum, acuminatum, trinervium. Sepala lateralia linearia, acuminata, uni- vel binervia. Petala sepalo dorsali similia sed angustiora, basi trinervia. Labellum unguiculatum; unguis medio biauriculatus; lamina hastata, acuminata; lobi laterales recurvi, serrulati. Columna generis.

A small epiphytic herb. Leaves equitant, laterally flattened, linear-lanceolate to lanceolate, acute or acuminate, sessile, 4-6 cm. long, 3-5 mm. broad (laterally). Pseudobulbs small, complanate, inclosed in the bases of leaves, unifoliate, 1-1.5 cm. long. Inflorescence a subumbellate raceme, simple or branched; scape from the base of a pseudobulb, slender, about 4-6 cm. long, with several infundibuliform bracts; bracts of the inflorescence scarious, lanceolate, acute or acuminate, about 1.5-2 mm. long, spreading. Pedicels filiform, spreading, with the ovary about 6 mm. long. Dorsal sepal linear-lanceolate, acuminate, 3-nerved, about 10 mm. long and 1.5 mm. broad. Lateral sepals linear, acuminate, slightly oblique, 1-2-nerved, about 12-13 mm. long and 1 mm. broad. Petals similar to the dorsal sepal but slightly narrower, 3-nerved at the base, 1-nerved above. Lip arising at the base of the column but free from it, long-unguiculate, the claw about 4 mm. long, thickened and biauriculate at a point half way between the base of the lip and the lateral lobes, the thickening papillose-pubescent on the anterior side; blade of the lip hastate, acuminate, about 4 mm. long and 2 mm. broad, the lateral lobes recurved, serrulate, the apex strongly acuminate. Column slender, about 3 mm. long, characteristic of the genus.—BOCAS DEL TORO: epiphytic, Mosquito Hill, Aug. 12-16, 1938, (comm. by Dr. H. Cordes to) *Woodson, Allen & Seibert 1932* (Herb. Missouri Bot. Garden, TYPE).



*Notylia Cordesii* is allied to several of the Central American species of the genus, among them *N. bicolor* Lindl., *N. linearis* A. & S., *N. ramonensis* Schltr., and *N. Wulfschlaegeliana* Rchb.f. It is most closely allied to the last of these, *N. Wulfschlaegeliana*, from which it may be distinguished as a larger plant with distinctly larger leaves and flowers; by having the lip entirely free from the column; by having the auricles near the middle of the claw instead of at the base.

It is a pleasure to name this fine little orchid for Dr. Cordes, who has shown much interest in the flora of Panama.

TELIPOGON AMPLIFLORUS C. Schweinf., in Bot. Mus. Leaflet. Harv. Univ. 6: 34. 1938.—CHIRIQUÍ: epiphyte, vic. of Casita Alta, Volcán de Chiriquí, alt. about 1500–2000 m., June 28–July 2, 1938, *Woodson, Allen & Seibert 961*.

*Telipogon ampliflorus*, which was recently described from Costa Rica, is new to the flora of Panama. The flowers of the present specimens are somewhat smaller than those described by Schweinfurth.

#### ROSACEAE

(*Alchemilla* by L. M. Perry, Jamaica Plain, Mass.)

ALCHEMILLA PECTINATA HBK.—CHIRIQUÍ: vicinity of Casita Alta, Volcán de Chiriquí, alt. 1500–2000 m., common in clearings, June 30, 1938, *Woodson, Allen & Seibert 892*; Loma Larga to summit, Volcán de Chiriquí, alt. 2500–3380 m., July 5, 1938, *Woodson, Allen & Seibert 1042*. Known to extend from Mexico to Colombia and Bolivia, but previously unknown from Panama. No. 1042 is a typical specimen; 892 is a more stoloniferous and smallish specimen, but apparently belongs to this species.

ALCHEMILLA APHANOIDES L.f. var. SUBALPESTRIS (Rose) Perry—CHIRIQUÍ: Loma Larga to summit, Volcán de Chiriquí, alt. 2500–3380 m., July 5, 1938, *Woodson, Allen & Seibert 1041*. Originally described from Mexico. I have not seen previously this plant from farther south than Costa Rica. Reported by Standley (Fl. Costa Rica 2: 477. 1937) as extending to Bolivia.

**HESPEROMELES chiriquensis** Woodson, spec. nov. Arbuscula dense ramosa 1.5–3.0 dm. alta; ramis sat crassis subfastigiatis; ramulis juventate dense minuteque fulvo-hispidulis mox glabratis haud spinescentibus, internodiis 0.1–0.4 cm. longis; foliis plerumque obovato-suborbicularibus apice rotundatis vel paulo retusis rare subacutis basi late cuneatis 0.3–2.0 cm. longis 0.2–1.9 cm. latis margine inconspicue depresso-serrulatis coriaceis supra paulo illustris nervo medio dense minuteque fulvo-hispidulis subtus pallidioribus opacis nervo medio sparse hispidulis caeterumque glabris; petiolo 0.2 cm. longo fulvo-hispidulo; inflorescentiis corymbosis densis plurifloris; bracteis subfoliaceis lanceolatis 0.4–0.8 cm. longis; pedicellis subnullis; cupulis late conicis 0.3 cm. longis 0.35 cm. latis extus fulvo-hispidulis intus dense villosulis; sepalis triangulo-setosis 0.35 cm. longis ut in cupula vestitis; petalis obovato-oblongis 0.5 cm. longis 0.4 cm. latis basi unguiculatis pallide roseis; staminibus 20, filamentis 0.15–0.3 cm. longis, antheris 0.07 cm. longis; pistillis 0.5 cm. longis basi villosulis; fructu ignoto.—**CHIRIQUÍ**: Loma Larga to summit, Volcán de Chiriquí, alt. ca. 3300 m., July 4–6, 1938, *Woodson, Allen & Seibert 1078* (Herb. Missouri Bot. Garden, TYPE).

This handsome dwarf tree was found almost literally covered with its pale pink flowers, not far below the summit of the volcano. *H. obovata* (Pittier) Standl., of the neighboring peaks of Costa Rica, is distinguished from it by its white, smaller petals, and spinescent twigs. The extremely dwarf stature and very crowded foliage, probably induced by the high altitude, are also distinctive, as well as the depressed serrulation of the leaves.

POLYGALACEAE

(*S. F. Blake, Washington*)

**MONNINA XALAPENSIS** HBK.—**CHIRIQUÍ**: vicinity of Casita Alta, Volcán de Chiriquí, alt. 1500–2000 m., June 28–July 2, 1938, *Woodson, Allen & Seibert 802*. Apparently new to Panama; previously known from Vera Cruz to Nicaragua and Costa Rica.

EUPHORBIACEAE  
(P. C. Standley, Chicago)

**CROTON Allenii** Standl., sp. nov. Arbuscula 4-metralis ramosa, ramis gracilibus teretibus ochraceis sparse pilis stellatis sessilibus pauciradiatis pilosis, sat dense foliatis, internodiis brevibus vel elongatis; stipulae filiformi-subulatae 1.5–2 mm. longae apice glanduliferae deciduae; folia inter minora longipetiolata herbacea, petiolo gracili 2–3.5 cm. longo sparse stellato-piloso; lamina ovata vel oblongo-ovata 5–8 cm. longa 2.5–4.5 cm. lata acuta vel subabrupte breviter acuminata, basi late rotundata atque breviter cordata, arcte crenato-serrulata, utrinque viridis, sparsissime praesertim ad nervos stellato-pilosa, e basi 5-nervia, nervo medio supra basin utroque latere nervos ca. 4 emittente; flores monoeci racemosi, racemis terminalibus breviter pedunculatis 4–7 cm. longis laxe remotifloris, rhachi sat dense stellato-pilosa, pedicellis 1–3 mm. longis; flores fertiles pauci vulgo 1–2, interdum usque 6, sepalis 5 in statu fructifero 5–6 mm. longis subaequalibus lanceolato-oblongis acutis remote serratis dense stellato-pilosis erectis, petalis nullis; styli bis dichotome divisi glabri; flores masculi numerosi cito decidui in alabastro globosi atque 2.5 mm. diam., sparse stellato-pilosi; stamina ca. 10, filamentis glabris; capsula vix matura 5 mm. longa ubique dense pilis parvis patentibus stellato-pilosa.—COCLÉ: vicinity of Antón, Aug. 8, 1938, *Woodson, Allen & Seibert 1711* (Herb. Field Mus., TYPE; duplicate in Herb. Missouri Bot. Garden).

A notable addition to the rather few species of *Croton* known from Panama, distinctive in appearance because of its rather small and bright green leaves, which at first sight appear to be glabrous. The hairs of the pubescence vary considerably in form, but many of them are distinguished by having short basal rays and very long and soft central ones.

**PLUKENETIA VOLUBILIS** L.—LOS SANTOS: thickets between Los Santos and Guararé, July 11, 1938, *Woodson, Allen & Seibert 1201*. Apparently known from Central America only by this specimen. It is recorded or represented also from Dominica,

Colombia, Peru, and Bolivia. At least one other species of the genus occurs in northern Central America.

## DILLENACEAE

(*P. C. Standley, Chicago*)

**SAURAUIA Seibertii** Standley, sp. nov. Arbor, ramulis crassiusculis fere glabris sed sparsissime atque fere minute adpresso-furfuraceis; folia petiolata crassiuscula atque in sicco rigidula, petiolo 1.5–3.5 cm. longo sparse adpresso-furfuraceo; lamina oblongo-lanceolata 15–20 cm. longa 4.5–5.5 cm. lata acuminata, basin acutam versus paullo angustata, in toto margine arcte serrata, supra sublucida glaberrima, subtus ad nervos sparsissime adpresso-furfuracea, costa crassiuscula elevata, nervis lateralibus utroque latere ca. 15 angulo semirecto vel paullo latiore adscendentibus prominentibus teneris; paniculae axillares longipedunculatae folia aequantes vel paullo longiores, pedunculo usque 15 cm. longo minute sparse tomentello atque sparse adpresso-furfuraceo, paniculis amplis sublaxe multifloris ca. 12 cm. longis atque aequilatis, ramis dense tomentellis et sparse breviter furfuraceis, bracteis conspicuis interdum foliaceis angustis, pedicellis gracilibus dense tomentellis usque 15 mm. longis; sepala rotundato-ovata vel late elliptica ca. 8 mm. longa apice obtusa vel rotundata, utrinque densissime minute tomentella; petala alba glabra rotundato-elliptica vel ovalia ca. 14 mm. longa—CHIRIQUÍ: Bajo Mono, mouth of Quebrada Chiquero, along Río Caldera, alt. 1500–2000 m., “common along Río Caldera,” July 3, 1938, *Woodson, Allen & Seibert 1020* (Herb. Field Mus., TYPE; duplicate in Herb. Missouri Bot. Garden).

The practically glabrous, rather coarsely and regularly serrate leaves of this plant isolate it among the various Panama species of *Saurauia*. It is not closely similar to any of the rather numerous species occurring in Costa Rica.

## TILIACEAE

**LUEHEA CANDIDA** (Moc. & Sessé) Mart.—COCLÉ: llanos between Aguadulce and Antón, alt. ca. 15–50 m., July 12, 1938, *Woodson, Allen & Seibert 1203*. A handsome tree 10–15 m.

tall, bearing showy, white flowers. Not infrequent in the locality visited, but apparently not previously reported from Panama.

## BUXACEAE

(*C. L. Lundell, Ann Arbor, Mich.*)

**BUXUS CITRIFOLIA** Spreng.—CANAL ZONE: vicinity of Salamanca Hydrographic Station, Río Pequení, alt. ca. 80 m., July 28–29, 1938, *Woodson, Allen & Seibert 1563*. This interesting shrub has not been known previously to occur in Central America, having been collected or reported only in Cuba, Puerto Rico, and Venezuela.

## CELASTRACEAE

(*C. L. Lundell, Ann Arbor, Mich.*)

**MAYTENUS Woodsoni** Lundell, sp. nov. (pl. 22). Arbor 3 m. alta. Ramuli verticillati, breves et crassiusculi, striati, glabri. Folia glabra, coriacea, obovata, oblanceolata, oblanceolato-oblonga vel elliptica, 4–8 cm. longa, 1.8–4.1 cm. lata, vel interdum minora, apice acuta, obtusa vel rotundata, basi late cuneata, revoluta, supra mediam serrulata, venis utrinque 6 vel 7, reticulatis; petiolis 3–5 mm. longis. Flores fasciculati. Pedicelli usque ad 5 mm. longi, glabri. Calyx quinquefidus, lobis laciniatis, late ovatis vel suborbicularibus, 1.2–1.8 mm. longis, glabris. Petala vinacea, late ovata vel suborbicularia, usque ad 2.5 mm. longa, erosa. Stamina 5. Ovarium 3-loculare, ovulis in loculis solitariis. Pedicelli fructiferi 3.5–6 mm. longi. Capsula late obovoidea, 6–7 mm. longa. Semina 1 vel 3, arillata, obovoidea, ca. 4.5 mm. longa.

A tree 3 m. high; branchlets verticillate, rather short and stout, striate and angled, glabrous; buds covered with rufous-lacinate scales. Leaves glabrous, subverticillate at apex of branchlets, alternate otherwise. Stipules ligulate, up to 2.5 mm. long, maroon, long-lacinate. Petioles stout, 3 to 5 mm. long, shallowly grooved above. Leaf blades coriaceous to rigidly coriaceous, obovate, oblanceolate, oblanceolate-oblong or elliptic, usually 4 to 8 cm. long, 1.8 to 4.1 cm. wide, sometimes smaller, apex acute to rounded, base broadly cuneate, margin slightly revolute, conspicuously serrulate above the middle,

the serratures rounded and apiculate with short red inflexed teeth, costa prominent and rather thick beneath at base, slender toward apex, slightly elevated above, main lateral veins 6 or 7 on each side, prominulous beneath, plane or slightly impressed above, veinlets reticulate and prominulous beneath. Inflorescence usually at leafless nodes, reduced to a fascicle, the bracteoles of the reduced inflorescence persistent at base of pedicels, maroon, lacinate, forming a compact protuberance. Pedicels up to 5 mm. long, glabrous. Calyx deeply 5-lobed, the lobes red, laciniate, broadly ovate or suborbicular, 1.2 to 1.8 mm. long including fringe, glabrous. Petals vinaceous, broadly ovate or suborbicular, up to 2.5 mm. long, margin erose and colorless. Stamens 5. Ovary 3-celled, with 1 erect ovule in each cell. Fruiting pedicels 3.5 to 6 mm. long, jointed near base. Capsules broadly obovoid, 6 to 7 mm. long, 3-celled, 1- to 3-seeded. Seed arillate, obovoid, about 4.5 mm. long; endosperm copious; cotyledons 2.7 mm. long; radicle stout, terete, about 1 mm. long.—CHIRIQUÍ: Loma Larga to summit, Volcán de Chiriquí, alt. 2500–3380 m., July 4–6, 1938, *Woodson, Allen & Seibert 1065* (Herb. Univ. Michigan, TYPE in flower); same locality, *Woodson, Allen & Seibert 1088* (Herb. Univ. Michigan, COTYPE, in fruit).

*M. Woodsoni* approaches *M. verticillata* (R. & P.) DC., a species of Peru with varieties in Ecuador and Colombia. The Panama tree may be distinguished by its conspicuously serrulate leaves, fascicled flowers, much larger maroon calyx-lobes, and vinaceous petals. The laciniate margin of the stipules, bracts, and calyx-lobes is a noteworthy characteristic shared apparently by *M. verticillata*. The flowers appear to be dioecious, but from the material available I have not been able to determine this point definitely.

## MYRSINACEAE

(C. L. Lundell, *Ann Arbor, Mich.*)

PARATHESIS **Seibertii** Lundell, sp. nov. Arbor 4–6 m. alta. Ramuli crassiusculi, minute et parce adpresse rufo-lepidoti. Folia anguste oblonga vel oblongo-elliptica, 8.5–19 cm. longa, 2.2–4.6 cm. lata, apice basique acuminata, margine subrepanda

vel integra, membranacea, supra glabra, subtus parce et minute lepidota, nervis patentibus, fere 18-jugis, prominulis, punctulis multis (pleris breviter lineiformibus) auctis; petiolis 1.5–2.5 cm. longis. Inflorescentiae axillares, multiflorae, paniculatae, thyrsoidae, 8–9 cm. longae, parce lepidotae vel glabrae, pedicellis usque ad 6.5 mm. longis, quam bracteis multo longioribus; flores ante anthesin ca. 5 mm. longi, minute rufo-puberuli; sepala basi coalita, anguste triangularia, ca. 0.9 mm. longa, punctata; petala intus tomentosa, anguste lanceolato-attenuata, 5 mm. longa, basi coalita, punctata; stamina 3–3.2 mm. longa, antheris apiculatis, 1.7–2 mm. longis, dorso parce (1–4) atro-punctulatis, filamentis glabris, supra basin affixis; ovarium ad apicem minute rufo-tomentellum; stylus basi breviter pilosus.

A tree 4 to 6 m. high. Branchlets rather thick, at first minutely appressed rufous-lepidote. Leaves with petioles 1.5 to 2.5 cm. long, narrowly oblong or oblong-elliptic, 8.5 to 19 cm. long, 2.2 to 4.6 cm. wide, apex and base acuminate, margin somewhat repand, nearly entire, membranaceous, glabrous above, sparsely and minutely lepidote below, main lateral veins usually 18 on each side, nearly horizontal, prominulous on under-surface, picta numerous, mostly short-linear. Inflorescence axillary, many-flowered, paniculate, thyrsoid, 8 to 9 cm. long, sparsely lepidote or glabrous, pedicels up to 6.5 mm. long, much exceeding bracteoles; flowers before anthesis about 5 mm. long, finely rufous-puberulent; sepals united at base, narrowly triangular, about 0.9 mm. long, punctate; petals tomentose within, narrowly lanceolate-attenuate, 5 mm. long, united at base, linear-punctate; stamens 3 to 3.2 mm. long, anthers apiculate, 1.7 to 2 mm. long, dorsally few (1–4), black-punctate, filaments glabrous, subequaling anthers, attached slightly above base of petals; ovary rufous-tomentellous at apex, base of style short-pilose.—CHIRIQUÍ: valley of the upper Río Chiriquí Viejo, alt. 1300–1900 m., July 27, 1937, *Peggy & Gene White 27* (Herb. Univ. Michigan, TYPE).

Another collection, *Woodson, Allen & Seibert 798*, from vicinity of Casita Alta, Volcán de Chiriquí, Province of Chiri-

quí, Panama, June 28–July 2, 1938, at alt. of 1500–2000 m., is referable here, but differs in having smaller narrowly elliptic leaves. These collectors describe the fruits as “purple-black, depressed spherically, 1.2 cm.” in diam. The flowers are reported to be pale pink or pink with sweet odor.

*P. Seibertii* is closely related to *P. melanosticta* (Schlechtd.) Hemsl., a species of Mexico and northern Central America, from which it may be differentiated by the entire or slightly repand, narrower, very thin, predominantly oblong leaves, and the paucity of pubescence throughout. The other related species, *P. macrophylla* Rusby of Bolivia, has much smaller anthers shorter than the filaments, as well as other marked differences.

#### VITACEAE

*CISSUS EROSA* L. C. Rich.—COCLÉ: thickets between Las Margaritas and El Valle, Aug. 8, 1938, *Woodson, Allen & Seibert 1763*. *C. erosa* is abundant in the Antilles, and has been collected several times in British Guiana, but this is apparently its first record in Central America. It was seen but once in the vicinity where the collection was made.

#### GUTTIFERAE

(*P. C. Standley, Chicago*)

*HYPERICUM Woodsonii* Standley, sp. nov. Herba perennis dense caespitosa omnino glabra, caulibus numerosis 3–8 cm. longis suberectis, saepe plus minusve intertextis angulatis dense foliatis; folia parva internodiis multo longiora sessilia oblonga vel oblanceolato-oblonga obtusa vel subacuta plerumque 3–8 mm. longa, basin versus paullo cuneato-angustata dense punctata, marginibus saepe plus minusve revolutis; flores terminales solitarii breviter pedunculati; sepala viridia 4–5 mm. longa tenuiter nervata anguste oblonga, apice apiculato-acutata; petala lutea sepalis aequilonga; styli 3 erecti 1 mm. longi et ultra; capsula ovoideo-oblonga 4 mm. longa apice in stylos sensim attenuata 1-locularis; semina numerosa oblonga ochracea 0.6 mm. longa.—CHIRIQUÍ: forming mats on potrero, Loma Larga to summit, Volcán de Chiriquí, alt. 2500–3380 m., July 4–6, 1938, *Woodson, Allen & Seibert 1040* (Herb. Field



Mus., TYPE; duplicate in Herb. Missouri Bot. Garden). Prostrate in potrero, Potrero Muleto, Volcán de Chiriquí, 3120 m., July 19, 1938, *Mrs. M. E. Davidson 1048* (Herb. Field Mus.).

From all other species of *Hypericum* known from southern Central America this is conspicuously different in its low, depressed habit, the plant being perennial and forming dense, interlaced mats.

MYRTACEAE

(*P. C. Standley, Chicago*)

**EUGENIA salamancana** Standley, sp. nov. Arbor 6-metralis, ramulis crassiusculis rigidis teretibus, novellis dense pilis brevibus rigidulis patentibus pilosis, internodiis brevibus; folia mediocria breviter petiolata subcoriacea, petiolo crasso 5–7 mm. longo dense breviter piloso; lamina oblonga vel ovali-oblonga 7–9 cm. longa 2.5–4 cm. lata, apice rotundata atque subito caudato-acuminata, acumine ca. 1 cm. longo angusto attenuato, basi anguste rotundata, supra subopaca, ad costam subimpressam minute pilosula, aliter glabra, nervis venisque obsolete, subtus fere concolor, ad costam prope basin laminae pilosa, aliter glabra, costa gracili elevata, nervis lateralibus utroque latere ca. 12 sed obscuris, venis omnino occultis; flores ut videtur e ramis defoliatis nascentes solitarii(?) sessiles vel brevissime pedicellati, perfecti non visi.—CANAL ZONE: vicinity of Salamanca Hydrographic Station, Río Pequení, alt. 80 m., July 28–29, 1938, *Woodson, Allen & Seibert 1570* (Herb. Field Mus., TYPE; duplicate in Herb. Missouri Bot. Garden).

In leaf characters the species is unlike any other known from the region of the Isthmus, the nervation, except for the costa, being obscure or obsolete. The form of the inflorescence, although its structure is not well established, likewise appears to be quite distinctive.

MELASTOMACEAE

(*H. A. Gleason, New York*)

**CENTRONIA PHLOMOIDES** Triana—CHIRIQUÍ: vicinity of Casita Alta, Volcán de Chiriquí, alt. ca. 1500–2000 m., June 28–July 2, 1938, *Woodson, Allen & Seibert 842*. Previously known from Costa Rica.

*MICONIA LINDENII* Naud.—CHIRIQUÍ: Finca Lérida to Boquete, alt. ca. 1300–1700 m., July 8–10, 1938, *Woodson, Allen & Seibert 1143*. Previously known from Costa Rica and Venezuela.

*BLAKEA Woodsoni* Gleason, sp. nov. (Sect. *Pyxidanthus*). Arbuscula 5–7 m. alta. Rami irregulariter 4-angulati, internodiis circa 10 mm. longis paulo incrassatis, superne furfuraceo-hispidi, pilis curvatis crasse subulatis fere 1 mm. longis. Petioli crassi, 12–25 mm. longi, sicut rami sparse hispidi. Laminae chartaceae obovato-oblongae, usque 11 cm. longae 7 cm. latae, apice subrotundatae ad apiculum triangularem brevem, integrae, basi late cuneatae, vix 3-pli-nerviae, supra glabrae arctissime brunneo-punctulatae, subtus hinc inde brevissime hispidulae, praecipue ad venas. Flores solitarii ex axillis superioribus, pedicello 6 cm. longo, hispidulo, glabrescenti. Bracteae per paria connatae, pari exteriori 12 mm. longo primo hispidulo mox glabrescenti, margine vix 2-lobato; bracteae interiores quam exteriores 3 mm. longiores, glabrae, margine integro. Calyx quam bracteae interiores 7 mm. longior, glaber, lobis 6, semicircularibus, paulo retusis et tuberculato-apiculatis. Petala anguste triangulari-obovata, alba, 4 cm. longa. Antherae semi-ovatae 7 mm. longae. Stylus gracilis, ad stigma punctiforme angustatus.—CHIRIQUÍ: vicinity of Casita Alta, Volcán de Chiriquí, alt. 1500–2000 m., July 1, 1938, *Woodson, Allen & Seibert 951* (Britton Herb., New York Bot. Garden, TYPE). It is at once distinguished from other Panama species by its totally connate bracts. The hairs of the stem, peduncles, and bracts are very easily detached.

#### LECYTHIDACEAE

*GUSTAVIA BRACHYCARPA* Pittier, Contr. U. S. Nat. Herb. 26: 3. 1927.—CHIRIQUÍ: swampy forests, west of Remedios, June 24, 1938, *Woodson, Allen & Seibert 787*. As far as we are aware, this is the first record of this peculiar specimen since the collection of the type by Pittier in 1911. The specimens of Pittier, from near San Felix, in the same general vicinity of our trees, were in fruit only. Ours are in full flower and young fruit. In bloom, the trees of *G. brachycarpa* are by far the most showy

of the low forests of the country-side. The petals are pure white, 6, broadly obovate-oblong, and somewhat unequal, 4.5–5.0 cm. long, 2.2–2.5 cm. broad, broadly rounded, essentially glabrous within, but very densely and minutely puberulent-papillate without. The stamens are exceedingly numerous, forming a regular, involuted cup 1.5 cm. deep; the anthers are connivent, oblongoid, 0.2 cm. long, and dehisce apically. The handsome flowers are borne singly or in pairs, and are slightly fragrant. Pittier's description of the leaves, fruits, and branches is accurate, and corresponds very closely to our specimens.

## VACCINIACEAE

(W. H. Camp, New York)

*COMAROSTAPHYLIS chiriquensis* Camp, sp. nov. Frutex 1–3 m., ramis pubescentibus; folia rectangulo-ovata, petiolo 5–8 mm. longo, basi cuneata vel acuta, apice acuta, subcoriacea, 5–6 cm. longa, 1.0–1.5 cm. lata, supra glabra, subtus in foliis adultis dense ferrugineo- vel griseo-lanata, margine obscure undulata vel integerrima, revoluta; inflorescentia terminalis, paniculata, ubique obscure albido-puberula et plus minusve ferrugineo-pilosa, pilis glandulosis; pedicelli 2–3 mm. longi; bractea subacuminata; calyx 5-lobus, lobis ovato-acuminatis circ. 1.5 mm. longis, puberulis et sparse glandulosis; corolla globoso-urceolata, circ. 5 mm. longa, alba, extra obscure farinacea vel puberula, intra puberula, apice manifeste contracta, breviter 5-lobata, lobis puberulis; stamina 10, filamentis basin versus dilatatis, dense pubescentibus, circ. 2 mm. longis, antheris circ. 1.5 mm. longis, bicornutis; ovarium elongatoglobosum, pubescens.—CHIRIQUÍ: Loma Larga to summit, Volcán de Chiriquí, alt. ca. 2500–3380 m., July 4–6, 1938, *Woodson, Allen & Seibert 1033* (Britton Herb., New York Bot. Garden, TYPE).

This species, although closely related to *C. arbutoides* Lindl., may be distinguished from it by the greater number of conspicuous gland-hairs on the rachis and pedicels, these often being 1 mm. long, and the absence of the rusty-brown, woolly tomentum on these same structures—a characteristic feature

of *C. arbutoides*. In this last, all the inflorescence and often the floral structures are so covered with this tomentum that their surfaces are invisible, whereas in *C. chiriquensis* this is not the case. An additional interesting feature of this new species is the presence on the lower surface of the leaf of scattered gland-hairs on and near the midvein as well as on the petioles. Minute fruiting bodies of some fungus, similar in appearance to these glands, but easily recognizable as such, are also present on various organs of the type.

## GENTIANACEAE

(*F. P. Jonker, Utrecht; Halenia* by *C. K. Allen, Jamaica Plain, Mass.*)

*LISIANTHUS CHELONOIDES* L.f.—CHIRIQUÍ: Finca Lerida to Boquete, alt. ca. 1300–1700 m., July 8–10, 1938, *Woodson, Allen & Seibert 1111*. Previously recorded from Peru, Brazil, the Guianas, and the West Indies.

*SCHULTESIA BRACHYPTERA* Cham. forma *HETEROPHYLLA* (Miq.) Jonk.—PANAMÁ: boggy grasslands and marginal thickets, between Pacora and Chepo, alt. ca. 25 m., Aug. 1, 1938, *Woodson, Allen & Seibert 1647*. Previously known from Brazil, Venezuela, the Guianas, and Mexico.

*HALENIA Woodsoniana* C. K. Allen, spec. nov. Herba perennis (?), caule basi ramoso procumbente; ramulis floriferis pluribus erectis usque ad 7 dm. altis; ramulis sterilibus foliosis quam ramulis floriferis circiter  $\frac{1}{2}$  brevioribus ( $\pm$  3 dm. altis); internodiis inferioribus brevibus (1.5–3 cm.) superioribus longioribus (4–6.5 cm.); foliis sessilibus lineari-lanceolatis acuminatis leviter 3-nerviis, nervo medio prominente, usque ad 6 cm. longis et 0.7 cm. latis; inflorescentia terminalis axillarisve cymosa laxa pauciflora; calyce usque ad 1 cm. longo et ad ca.  $\frac{3}{4}$  corollae longitudinem aequante; lobis 3-nerviis lanceolatis acuminatis; corollae lobis ovalibus acutis leviter erosis; calcaribus usque ad  $\frac{1}{3}$  corollae longitudinem aequantibus horizontalibus ad leviter ascendentibus; staminibus 0.5 cm. longis; capsula late lanceolata usque ad 1.7 cm. longo.—CHIRIQUÍ: Volcán de Chiriquí, ca. 2500–3380 m., Loma Larga to summit, July 4–6, 1938, *Woodson, Allen & Seibert 1052* (Herb. Missouri Bot. Garden, TYPE).

The above species is distinctive because of the much-branched stem, somewhat procumbent at the base, the short leafy sterile shoots arising from the main stem, and the tall spreading, loosely flowered inflorescence, the pedicels of which are often pendulous. The species, the sole representative of the genus in Panama thus far found, is most closely related to *Halenia rhyacophila* Allen from Costa Rica.

## APOCYNACEAE

*RAUWOLFIA HIRSUTA* Jacq. var. **glabra** (Muell.-Arg.) Woods. comb. nov. (*R. canescens* L. var.  $\delta$  *glabra* Muell.-Arg. *Linnaea* 30: 394. 1860).—PANAMÁ: Isla Taboga, thickets near sea-level, July 23–24, 1938, *Woodson, Allen & Seibert 1530*.

*FORSTERONIA SPICATA* (Jacq.) G. F. W. Meyer—PANAMÁ: Isla Taboga, abundant, in thickets along rocky shore, July 23–24, 1938, *Woodson, Allen & Seibert 1551*. This species is of interest since it is predominantly a Caribbean element found at intervals upon the continent from southern Mexico to northern Colombia, and in Cuba. Upon the Pacific coast it has been reported only from Salvador and Costa Rica. This is the first record of the species from Panama.

*STEMMADENIA OBOVATA* (H. & A.) K.Sch. var. **MOLLIS** (Benth.) Woods.—LOS SANTOS: between Los Santos and Guararé, July 11, 1938, *Woodson, Allen & Seibert 1200*; vicinity of Las Tablas, alt. 15 m., Sept. 12, 1938, *Allen 812*. Previously recorded from southern Mexico to Costa Rica, where it is relatively limited in distribution; also very local in western Ecuador.

*PRESTONIA remediorum* Woodson, spec. nov. Frutex volubilis, ramis ramulisque crassiusculis ferrugineo-hirtis. Folia obovato-elliptica apice breviter acuminata basi obtuse cuneata 15–18 cm. longa 9–11 cm. lata membranacea opaca supra subtusque ferrugineo-pilosula, petiolis 1.5 cm. longis, appendicibus stipulaceis intrapetiolearibus pectinatis ca. 0.25 cm. longis. Inflorescentia lateralis simplex pluriflora corymbiformis folia ca.  $\frac{1}{2}$  aequans, pedicellis ca. 1 cm. longis ferrugineo-hirtellis, bracteis foliaceis oblongo-lanceolatis acuminatis 1.0–1.5 cm. longis foliaceis ferrugineo-puberulis. Calycis

lobi oblongo-lanceolati acuminati 1.7–1.8 cm. longi foliacei dense ferrugineo-hirtelli, squamellis profunde pectinatis subcallosis ca. 0.2 cm. longis appendicibus stipulaceis similibus. Corollae luteae extus dense ferrugineo-velutinae tubus subinfundibuliformis in alabastrum submaturum 2 cm. longus basi ca. 0.15 cm. diam., faucibus ca. 0.35 cm. diam.; lobi obovato-dolabriformes acuminati 1.7 cm. longi. Anthera 0.7 cm. longa glabra apice paululo exserta. Stigma fusiforme 0.3 cm. longum; ovarium ovoideum ca. 0.15 cm. altum glabrum; nectaria 5 carnosae basi concrenentia ovarium aequantia. Folliculi ignoti.—CHIRIQUÍ: thicket, between Río Chiriquí and Remedios, alt. ca. 15–50 m., July 11, 1938, *Woodson, Allen & Seibert 1180* (Herb. Missouri Bot. Garden, TYPE).

When this species was collected, it was mistaken for *P. isthmica* Woods., an endemic of Costa Rica. The leaves of *P. remediorum* are quite distinct, however, by reason of their cuneate base, and the conspicuous, pectinate calycine squamellae are quite unlike those of any species with which I am familiar.

**FERNALDIA speciosissima** Woodson, spec. nov. Frutex volubilis alte scandens, nec foliis nec calycibus necque ovariis visis; corollae speciosissimae albae extus omnino glaberrimae tubo proprio 2.5–2.8 cm. longo basi ca. 0.25 cm. diam. stricto haud gibboso, faucibus tubulosis 2.6–2.8 cm. longis intus dense arachnoideo-villosis, ostio ca. 0.6 cm. diam., lobis oblique obovatis obtusis 2.8–3.0 cm. longis patulis utrinque glaberrimis; antheris anguste lanceolato-sagittatis basi obtuse auriculatis 1 cm. longis glaberrimis; stigmate fusiformi basi minute digitato-appendiculato 0.3 cm. longo.—CHIRIQUÍ: thickets, between Río Chiriquí and Remedios, alt. 15–50 m., July 11, 1938, *Woodson, Allen & Seibert 1179* (Herb. Missouri Bot. Garden, TYPE).

It is exasperating to have to describe this species merely from several detached corollas found at the base of a tall tree supporting the liana. Efforts to obtain more ample material being futile at the time of collection, complete confidence none the less may be placed in the generic identification of the corollas (which, of course, contain the stamens and stigma as

is customary in the Echitoideae). The anthers, stigma, and arachnoid internal villosity of the corolla are all unmistakable characters, although the villosity differs from that of the three other known species of the genus in being limited to the throat. The corollas of *F. speciosissima* much surpass those of the other known species, and the narrowly tubular throat is quite distinct. Eastern Chiriquí is one of the least known and most promising floristic regions of Panama, as is graphically illustrated by the discovery of both *Prestonia remediorum* and *Fernaldia speciosissima*, literally within a stone's throw of one another.

## ASCLEPIADACEAE

*MACROSCEPIS panamensis* Woodson, spec. nov. (fig. 1). Suffrutex volubilis; ramis dense luteo-pilosis pilis dissimilibus tum brevibus simplicibus tum multo longioribus multicellularibus sicut ad petiolos et pedunculos pedicillosque; foliis oppositis petiolatis latissime ellipticis vel obovato-ellipticis apice attenuate subcaudato-acuminatis basi late auriculatis 14–17 cm. longis 9–11 cm. latis membranaceis opacis supra sparse strigosis subtus farinulento-puberulis nervo medio subtus luteo-pilosis, petiolo 2 cm. longo; inflorescentiis axillaribus alternatis umbelliformibus 6–8-floris, pedunculo ca. 2 cm. longo; bracteis lineari-lanceolatis foliaceis ca. 1 cm. longis vel infra dense luteo-pilosis; pedicellis 0.8 cm. longis similiter vestitis; calycis laciniis late ellipticis acuminatis foliaceis 0.5–0.6 cm. longis minute puberulis margine ciliatis intus eglandulosis; corollae salverformis extus omnino glaberrimae pallide luteo-viridis tubo campanulato 0.9–1.0 cm. longo medio inflato ibique ca. 0.8 cm. diam. faucibus constrictis minute hispidulis ceterumque glaberrimis, limbo patulo 1.8–1.9 cm. lato intus minute hispidulo-papillato ca. dimidio lobato lobis obtusis, coronae squamis tubo fere ad fauces adnatis apice subquad-ratis integris introrsum replicatis basi calloso-geniculatis tubo stamineo adnatis; gynostegio subsessili ca. 0.45 cm. alto, antheris brevissime appendiculatis basi coronae adnatis, stigmate obscure 5-lobato ca. 0.3 cm. diam.; polliniis oblique pyriformibus valde compressis ca. 0.1 cm. longis, caudiculis multo

brevioribus, retinaculo oblongo caudiculum aequante; folliculis ignotis.—PANAMÁ: thickets near Capira, July 12, 1938, *Woodson, Allen & Seibert 1228* (Herb. Missouri Bot. Garden, TYPE); liana in thickets, Isla Taboga, July 23–24, 1938, *Woodson, Allen & Seibert 1432*.

*Macroscepis panamensis* differs from *M. tristis* (Seem.) Benth., the only species of the genus previously known from Panama, and apparently collected but once (*Seemann 158*,

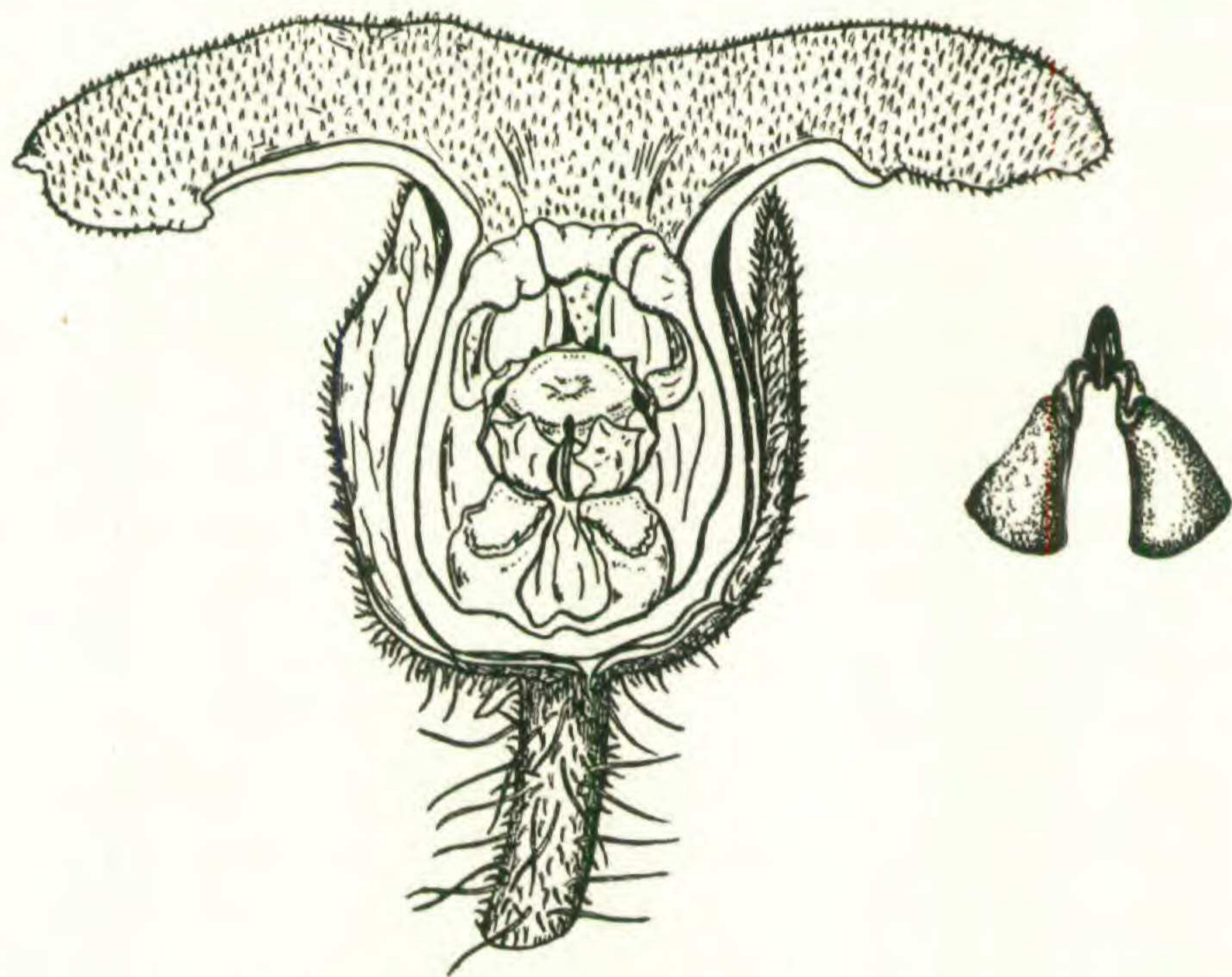


Fig. 1. *Macroscepis panamensis* Woodson. Flower in section, and pollinia. (Drawing by A. A. Heinze.)

in the Province of Veraguas near Natá), principally in the flowers. The corolla of *M. tristis* is described as absolutely glabrous, the tube light brown, and the limb dark chocolate. It is surprising that *Macroscepis* has not been collected previously in the province of Panama, as it is apparently widespread.

MARSDENIA CRASSIPES Hemsl.—PANAMÁ: thickets near Arraiján, alt. ca. 15 m., June 22, 1938, *Woodson, Allen & Seibert 779*. This is apparently the first collection of this endemic species since the discovery of the type specimen by Dr. Sutton Hayes. The corolla is greenish-yellow, and the corona seg-



ments, far surpassing the anther membranes, overhang the rostrate stigma.

*MARSDENIA MACROPHYLLA* (H. & B.) Fourn.—LOS SANTOS: thickets between Los Santos and Guararé, July 11, 1938, *Woodson, Allen & Seibert 1197*. As far as I am aware, this is the second time this species has been collected in Panama. I have been unable to examine the first, collected by Seemann (n. 611) near the city of Panamá, but specimens in the herbarium of the Missouri Botanical Garden, cited as of this species by Rothe (*Engl. Bot. Jahrb.* 52: 416. 1915) from Central America, have obtuse or rounded leaf bases and anther membranes slightly surpassing the crown segments (used as a key character by Rothe). On the other hand, our specimen has obviously cordate leaves, and the crown segments equal, or even slightly surpass the anther membranes.

*GONOLOBUS EDULIS* Hemsl.—BOCAS DEL TORO: thickets near Guabito, Aug., 1938, *J. H. Permar s.n.* Previous records of this plant have indicated its range from southern Mexico to Costa Rica. The material thoughtfully sent by Mr. Permar consists of follicles 7–8 cm. long, approximately 5 cm. in diameter, which bear conspicuous wings about 1 cm. broad.

*GONOLOBUS Monnicheanus* Woodson, spec. nov. (fig. 2). Frutex volubilis. Ramuli graciliusculi ferrugineo-pilosuli inferne glabrati. Folia opposita longiuscule petiolata, ovato-oblonga apice abrupte subcaudato-acuminata basi latiuscule cordata 4.9–9.0 cm. longa 2.5–4.5 cm. lata membranacea concoloria supra sparse ferrugine hispidulo-pilosula nervo medio basi pauciglanduligera subtus sparsiuscule ferrugineo-strigosula; petiolus 2.5–3.0 cm. longus pilosulus. Inflorescentia lateralis alternata longiuscule pedunculata umbelliformis flores mediocres dilute virido-luteos 10–30 gerens; pedunculi 3–5 cm. longi minute pilosuli; bracteae lineari-lanceolatae vix 0.2 cm. longae; pedicelli 2.5–3.5 cm. longi gracili minute pilosuli; calycis lacinae ovato-lanceolatae anguste acuminatae 0.8 cm. longae apicibus valde reflexis glabris caeterumque ferrugineo-pilosulae, squamellis alternatis solitariis dentiformibus ca. 0.15 cm. longis; corolla rotata dilute viridi-lutea extus dense

puberulo-papillata, tubo late conico ca. 0.5 cm. profundo basi ca. 0.1 cm. diam. intus dense minuteque hispidulo, lobis late ovatis obtuse acuminatis 1 cm. longis basi ca. 0.7 cm. latis apice valde reflexis; gynostegium anguste (ca. 0.2 cm.) stipitatum subalato-costatum, stigmatе 5-gono ca. 0.5 cm. diam., antheris brevissime rotundeque apiculatis, polliniis compresse ovoideis ca. 0.1 cm. longis caudiculas subaequantibus, corpusculo compresse oblongo-sagittato ca. 0.025 cm. longo; corona exterior latissime campanulata 5-partita carnosae saturate luteae

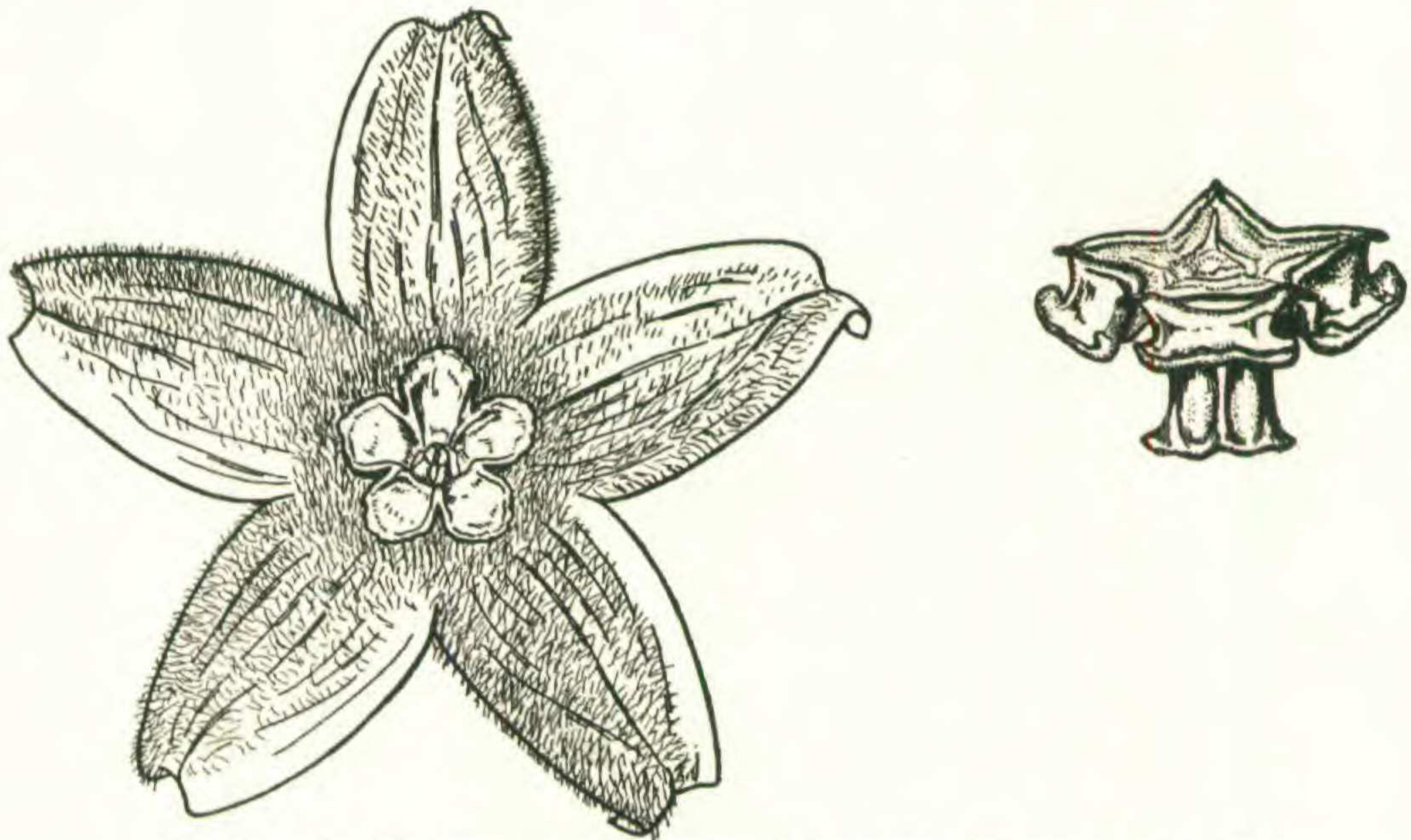


Fig. 2. *Gonolobus Monnicheanus* Woodson. Flower with gynostegium removed to show corona; gynostegium. (Drawing by A. A. Heinze.)

glabra corolla basi adnata ca. 0.7 cm. diam. ca. 0.2 cm. profunda, corona interior antheris adnata, squamis subreniformibus ca. 0.25 cm. latis 0.15 cm. longis patulis; folliculis ignotis.—CHIRIQUÍ: thickets, between Finca Lérida and Boquete, alt. 1300–1700 m., July 8–10, 1938, *Woodson, Allen & Seibert 1108* (Herb. Missouri Bot. Garden, TYPE).

This species is named in honor of Mr. Tollef B. Mönniche, the master of Finca Lérida and a discriminating and enthusiastic naturalist, in grateful memory of his innumerable kindnesses, not only to itinerant botanists, but to the multitude of other pilgrims who make their way, sure of an understanding

welcome, to his remarkable establishment on the high slopes of the Volcán de Chiriquí. *G. Monnicheanus* is evidently closely related to both *G. edulis* Hemsl. and *G. dubius* Pittier, but differs conspicuously from the former by the remarkable development of the outer corona, and from the latter in the hispidulous indument of the corolla.

## CUSCUTACEAE

(*T. G. Yuncker, Greencastle, Ind.*)

CUSCUTA **Woodsonii** Yuncker n. sp. (fig. 3). Caules crassi. Flores 4 mm. longi ab floris base ad corollae sinum, subsessiles in dispersis inflorescentibus compactis. Calycis lobi orbiculari-ovati, late imbricati, obtusi, plus minusve carinati. Corolla campanulata, lobi late ovati, obtusi, auriculati. Stamina lobis corollae dimidio breviora, antherae ovoideae, filamenta subulata, non teretia. Scaevae exsertae, oblongae, fimbriatae. Styli ovarium ovoideum circa aequantes, paulo subulati. Capsula depresso-globosa, usque ad 6 mm. diametro, circumscissilia, apertura intrastylaris lata. Semina 4, circ. 2.5 mm. longa, ovalia, hilo oblongo, diagonali.

Stems coarse. Flowers membranous or somewhat fleshy, about 4 mm. in length from the base to the corolla sinuses, or 7 cm. to the apex of the corolla-lobes when erect, subsessile in scattered, few-flowered, compact clusters. Calyx rather loose about the corolla and scarcely reaching the sinuses, lobes orbicular-ovate, broadly overlapping, obtuse, fleshy in the median and basal parts, becoming thin towards the slightly uneven edges, commonly one or more lobes carinate. Corolla campanulate, lobes about as long as the tube, or slightly shorter, broadly ovate, obtuse, strongly auriculate at the base and broadly overlapping, upright to spreading. Stamens reaching to about the middle of the corolla-lobes, filaments very subulate, flattened (not terete), somewhat longer than the ovoid anthers. Scales prominent, reaching the anthers, oblong, fringed with medium-length processes about the top and sparingly so along the sides, bridged below the middle, somewhat thick and fleshy toward the attached basal part. Styles about equal to the ovoid ovary, stout and somewhat subulate.

Capsule depressed-globose, up to 6 mm. in diameter, intrastylar aperture large, becoming definitely circumscissile when mature although this character may be rather obscure in young fruit, surrounded by the withered corolla which eventually splits as the capsule enlarges. Seeds 4, about 2.5 mm. long, oval in outline, hilum oblong, oblique.—CHIRIQUÍ: vicinity of Casita Alta, Volcán de Chiriquí, alt. 1500–2000 m., June

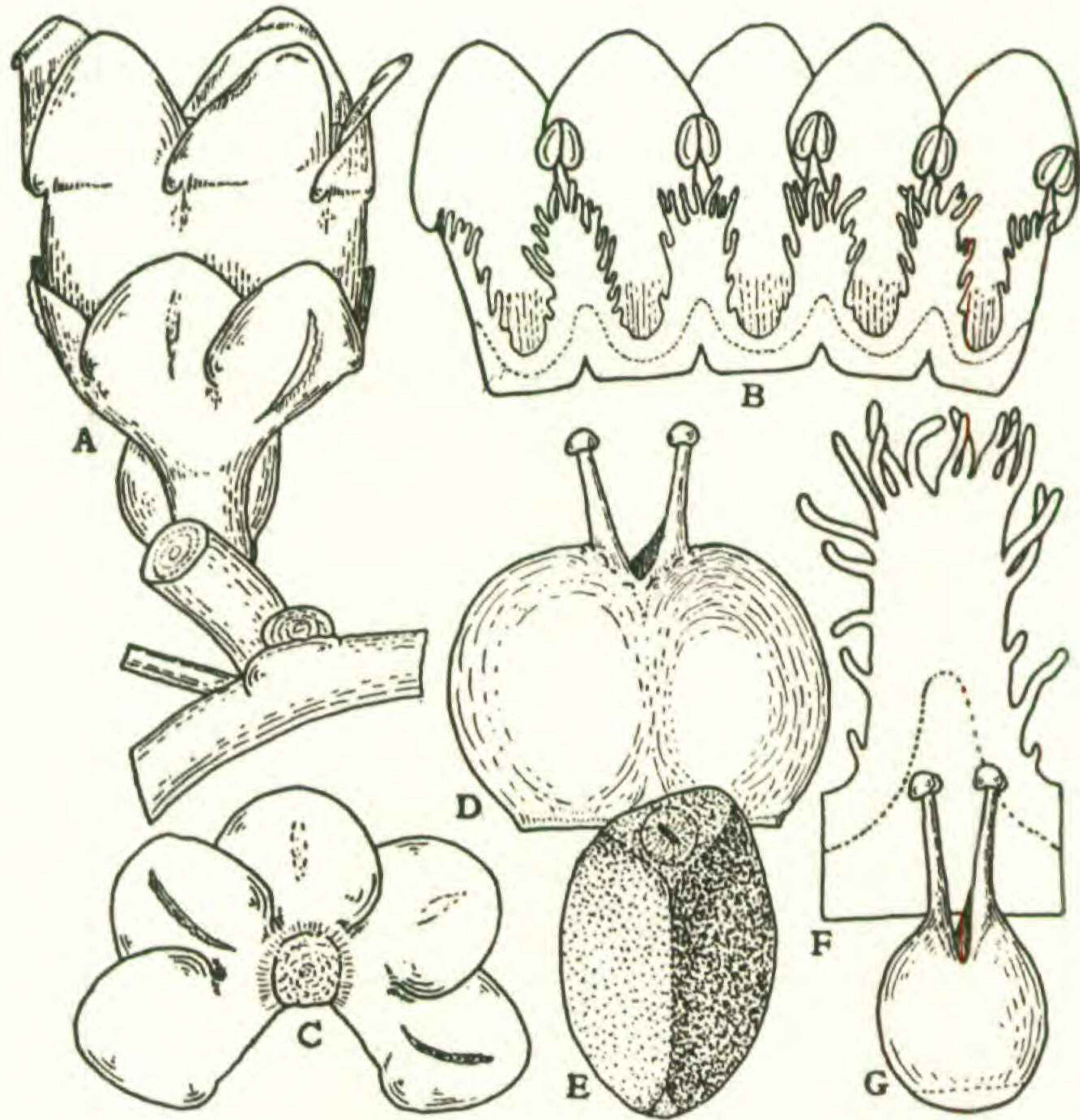


Fig. 3. *Cuscuta Woodsonii* Yuncker n. sp.: A, flower  $\times 5$ ; B, opened corolla  $\times 5$ ; C, opened calyx  $\times 5$ ; D, capsule  $\times 5$ ; E, seed  $\times 10$ ; F, individual scale  $\times 10$ ; G, ovary  $\times 5$ .

28–July 2, 1938, on a species of *Eupatorium* (?), Woodson, Allen & Seibert 950 (Herb. Missouri Bot. Garden, TYPE).

The genus *Cuscuta* appears to be poorly represented in Panama. The only species previously known to occur there is *C. trichostyla* Engelm. which is represented, so far as I know, by only a single specimen collected by Tweedie. *C. Woodsonii* differs from *C. trichostyla* in most of the distinctive characters given below. It appears to be most closely allied with those

included in the subsection Subulatae of the section Eugrammica although the styles do not become so strongly subulate as do those of the species included there. Its chief distinguishing features are the size of the flowers, fruit, and seeds, which are among the largest in the genus; the strongly subulate and flattened filaments; the prominent, oblong scales; and especially the prominently auriculate corolla-lobes, a character more strongly developed here than in any other known species.

## BIGNONIACEAE

*ARRABIDAEA OBLIQUA* (HBK.) Bur.—PANAMÁ: Gorgona Beach, vic. Gorgona, fr. Aug. 7, 1938, *Woodson, Allen & Seibert 1688*. Previously known from Venezuela and Colombia.

*ARRABIDAEA PLEEI* DC.—COCLÉ: between Aguadulce and Antón, alt. 15–50 m., July 12, 1938, *Woodson, Allen & Seibert 1224*. PANAMÁ: beach at Nueva Gorgona, Aug. 7, 1938, *Woodson, Allen & Seibert 1689*. Previously known from Venezuela and northern Colombia.

*LUNDIA CORYMBIFERA* (Vahl) Sandw.—CHIRIQUÍ: banks of the Río Chiriquí, vic. Chiriquí, alt. 15 m., July 11, 1938, *Woodson, Allen & Seibert 1178*. Although the species has been reported from Costa Rica, and occurs frequently from Colombia to Brazil, its existence in Panama has previously been unknown.

*SALDANHAEA SEEMANNIANA* O. Ktze.—CANAL ZONE: Victoria Fill, near Miraflores Locks, fl. April 2, 1939, *P. H. Allen 1755*. PANAMÁ: Río de Panamá, near Capira, fl. April 4, 1938, *P. H. Allen 730*; vic. Capira, fr. July 15, 1938, *Woodson, Allen & Seibert 1310*. COCLÉ: vic. of Penonomé, alt. 15–300 m., fl. Feb. 23–March 22, 1908, *R. S. Williams 522* (U. S. Nat. Herb. TYPE of *Adenocalymma cocleensis* Pittier). Although previously reported from Panama by O. Kuntze, more recently the plant has been described as *Adenocalymma cocleensis*, a synonymous name.

*TABEBUIA HETEROTRICHA* (DC.) Hemsl.—CANAL ZONE: Ancon, fl. May 1, 1934, *J. P. Keenan 323* (U. S. Nat. Herb.); vic. Summit, fl. March 17, 1934, *B. Avilla 314* (U. S. Nat. Herb.). PANAMÁ: Alhajuela, Chagres Valley, alt. 30–100 m., st. May 12–15,

1911, *H. Pittier 3501* (Gray Herb.); vic. of Chorrera, fl. March 5, 1939, *P. H. Allen 1698*; Sabanas, fl. April 1933, *Bro. Paul 307* (U. S. Nat. Herb.). Frequently confused with *Tabebuia chrysantha* (Jacq.) Nichols., but distinguishable by having a very densely woolly calyx, covered with long simple hairs and a much shorter stellate tomentum which can be seen only by the removal of the longer hairs.

The following additional specimens extend the range from Venezuela and Panama to Costa Rica and Nicaragua: COSTA RICA: without definite locality, fl. April 12, 1923, *A. M. Brenes 3876* (Herb. Field Mus.). NICARAGUA: south of Managua, fl. March 3, 1922, *J. M. Greenman & M. T. Greenman 5714* (Herb. Missouri Bot. Garden).

*TABEBUIA PALMERI* ROSE.—PANAMÁ: vic. Bejuco, fl. Feb. 9, 1939, *P. H. Allen 1630*. Previously known to extend from the state of Michoacan in Mexico to Nicaragua.

The species flowers without leaves, making accurate determination impossible at the present time. However, flowers, pubescence and branchlets agree well with typical material of the species.

#### GESNERIACEAE

(*C. V. Morton, Washington*)

*TUSSACIA Woodsoni* Morton, sp. nov. Herba terrestris, caulibus non ramosis, apicem versus dense pilosulis; folia opposita aequalia, subsessilia, petiolo vix 5 mm. longo; lamina foliorum ovalis, usque ad 15 cm. longa et 7 cm. lata, acuta, basi longe (3–4 cm.) decurrens, tenuiter membranacea, valde crenata, supra scaberula, subtus praecipue in venis pilosula, venis primariis ca. 7-jugis; inflorescentia umbellata, ca. 4-flora, pedunculo communi axillari solitario, 2.3–2.8 cm. longo, pilosulo, apice bibracteato, bracteis linearibus, ca. 7 mm. longis, integris, pilosulis, pedicellis 12–13 mm. longis, pilosulis, apice vix incrassatis; calyx aurantiacus, ca. 15 mm. longus, campanulatus, externe scaberulo-strigillosus, tubo ca. 12 mm. longo, 10 mm. lato, lobis late triangularibus, ca. 3 mm. longis, acutis, glanduloso-denticulatis, dentibus 1 vel 2 utroque latere; corolla flava et aurantiaca, ca. 18 mm. longa, tubulosa, externe pilosa, limbo

patente, ca. 15 mm. lato.—CHIRIQUÍ: between Río Chiriquí and Remedios, alt. 15–50 m., July 11, 1938, *Woodson, Allen & Seibert 1195* (U. S. National Herb., no. 1,748,081, TYPE).

I had at first identified this collection as *Tussacia Friedrichsthaliana* Hanst., but Dr. Woodson, who had collected the latter species twice (nos. 1614 and 1642), told me that in the field he had considered it a distinct species, chiefly on the basis of the differently colored calyx (deep orange rather than pale yellow). With this in view I re-examined the material and have concluded that no. 1195 does in fact represent an undescribed species. All the collections of *T. Friedrichsthaliana* have the corolla glabrous, whereas no. 1195 has a distinctly pilose corolla. The different coloration of the calyx is not apparent in dried material, and requires field investigation to determine its importance. Both calyx and corolla evidently vary somewhat in color, at least according to collectors' field notes. *Woodson, Allen & Seibert 1642* says, "calyx yellowish-green, corolla green with orange scarlet lines at base of lobes"; no. 1614 says, "corolla orange"; *Kenoyer 536*, "flowers yellow"; *Standley 40952* and *41121*, "calyx green, corolla orange"; *Seibert 556*, "flowers orange"; and *Seibert 569*, "flowers orange, streaked in corolla with reddish orange."

**KOHLERIA serrulata** Morton, sp. nov. *Moussonia*. Frutex ramosus, caulibus dense hirto-tomentosis, serius glabrescentibus, ca. 2 mm. diam., subteretibus; petioli usque ad 12 mm. longi, flavo-tomentosi; lamina foliorum ovato-lanceolata, usque ad 7.5 cm. longa et 4 cm. lata, acuminata, basi rotundata, chartacea, serrulata, supra scabro-pilosula, subtus dense pilosula, venis primariis ca. 7-jugis; flores solitarii, axillares, pauci, non pseudospicati, pedicello 15–18 mm. longo, 5 mm. supra basim bibracteato, bracteis subulatis, ca. 4 mm. longis, dense tomentosis; calycis pars adnata campanulata, ca. 2.5 mm. longa et 3 mm. lata, dense pilosa, pars libera 7 mm. longa, tubo brevissimo vix 1 mm. longo externe piloso intus glabro, lobis erectis lanceolatis 6 mm. longis et 2.2 mm. basi latis, acuminatis, apice non recurvatis, integris, margine non incrassatis, externe dense pilosis, intus sparse pilosulis; corolla aurantiaco-

rubra, 25 mm. longa, tubulosa, tubo basi non calcarato, in calyce erecto, basi 5.5 mm. lato, superne gradatim ampliato, vix ventricosus, in fauce non contracto, 9–11 mm. lato, externe dense pilosulo, intus glaberrimo, limbo brevi, lobis erectis, suborbicularibus, ca. 3 mm. longis, erosis, immaculatis; filamenta in basi corollae tubi inserta, cum tubo non adnata, inter se omnino libera, basin versus pilosa, superne glabra, non contracta, 22–25 mm. longa; antherae liberae, ca. 2 mm. longae, 1.5 mm. latae, loculis oblongis, non confluentes; ovarium (pars libera) conicum, brevissimum, dense pilosum; stylus rectus, glaber; stigma stomatomorphum; discus annularis, brevissimus, glaber, paullo undulatus.—CHIRIQUÍ: Bajo Mono, mouth of Quebrada Chiquero, along Río Caldera, alt. 1500–2000 m., July 3, 1938, Woodson, Allen & Seibert 1609 (U. S. National Herb., no. 1,746,849, TYPE).

Perhaps related to *Kohleria elegans* (Dcne.) Loes. but distinguished by the solitary rather than umbellate flowers, the less sharply acuminate calyx-lobes, the included free anthers and glabrous style.

CAMPANEA **chiriquana** Morton, sp. nov. *Eucampanea*. Planta epiphytica, caulibus dense piloso-tomentosis, pilis brunneis multiseptatis; folia opposita paullo inaequalia, longe petiolata, petiolo usque ad 4 cm. longo, dense brunneo-tomentoso; lamina foliorum ovato-oblonga, usque ad 17 cm. longa et 9 cm. lata, apice cuspidato-acuminata, basi cuneata in petiolum decurrens, membranacea, dentata basi excepta, supra pilosula, subtus praecipue in venis dense brunneo-tomentosa, venis primariis 7- vel 8-jugis; inflorescentia umbellata triflora, pedunculo communi pendulo, valde elongato, ca. 20 cm. longo, dense brunneo-tomentoso, apice bibracteato, bracteis linearibus, ca. 9 mm. longis, dense tomentosis, pedicellis usque ad 5.5 cm. longis, dense tomentosis; calycis lobi lanceolati, 8–9 mm. longi, acuminati, non evidenter venosi, dense tomentosi; corolla pallide flava, maculata, ca. 2.5 cm. longa, tubo basi erecto, valde ventricosus, medio 1.8 cm. lato, faucem versus contracto, externe brunneo-piloso, limbo parvo, lobis rotundatis, intus glabris.—CHIRIQUÍ: vicinity of Casita Alta, Volcán de Chiri-



quí, alt. 1500–2000 m., June 28–July 2, 1938, *Woodson, Allen & Seibert 935* (U. S. National Herb., no. 1,747,001, TYPE).

Near *Campanea Oerstedii* (Klotzsch) Oersted, of Costa Rica, but with the pubescence of the stems and under-surface of the leaves more nearly tomentose (as in *C. Humboldtii*), the calyx-lobes smaller and not evidently nerved, and the corolla more prominently ventricose. The species of this genus are badly in need of a careful revision.

**SOLENOPHORA australis** Morton, sp. nov. Frutex 5 m. altus, caulibus atropurpureis obtusangulatis subquadrangulatis, glaberrimis; petiolus usque ad 4.5 cm. longus, fere glaber, apicem versus pilis sparsis flaccidis brunneis multiseptatis praeditus; lamina foliorum ovalis, usque ad 15 cm. longa et 8.5 cm. lata, acuminata, basi perspicue obliqua, rotundata, papyracea, valde biserrata, supra sparse pilosula, subtus in venis sparse scabro-pilosula, venis primariis ca. 9-jugis; flores subumbellati, pedunculo communi solitario, usque ad 4.5 cm. longo, 1.5 mm. diam., compresso, glaberrimo, ca. 3-floro, apice bibracteato, bracteis subulatis crassis ca. 1 cm. longis apice pilosulis, pedicellis ca. 1.7 cm. longis crassis glaberrimis medio bibracteolatis apice paullo incrassatis; calyx venosus, 3 cm. longus, externe fere glaber, pilis paucis minutis flaccidis multiseptatis apicem versus praeditus, intus dense pilosus, tubo subcylindrico, ca. 2.2 cm. longo, 1 cm. lato, basi late cuneato, lobis erectis ca. 8 mm. longis, triangularibus acuminatis margine glanduloso-denticulatis, dentibus 3 vel 4 utroque latere; corolla externe aurantiaca, intus flava, 8.5 cm. longa, externe parce pilosa, intus glabra, tubo 6.5 cm. longo, basi cylindrico, superne gradatim ampliata, vix ventricosus, apice 2.5 cm. lato, in fauce non contracto, limbo patente subbilabiato, lobis late obovatis vel suborbicularibus, utrinque glabris, apice subtruncatis erosis, intus marginem versus purpureo-maculatis; stamina basi corollae tubi inserta, filamentis latis glabris basi ca. 1.5 cm. connatis, antheris apice connatis, 4.5 mm. longis, 4 mm. latis, connectivo hastato glabro, loculis hippocrepiformibus, apice confluentibus, longitudinaliter dehiscentibus; stylus elongatus, compressus, ca. 2 mm. latus, valde pilosulus; stigma

latum stomatomorphum; ovarium inferum glaberrimum, placentae lamellae utrinque ovuliferae; disci glandulae 2 posticae, magnae, basi connatae, apice rotundatae, ca. 2.5 mm. longae, ubique dense pilosae.—CHIRIQUÍ: vicinity of Casita Alta, Volcán de Chiriquí, alt. 1500–2000 m., June 28–July 2, 1938, *Woodson, Allen & Seibert 847* (U. S. National Herb., no. 1,746,987, TYPE).

Closely related to *Solenophora calycosa* Donn. Smith, of Costa Rica, but distinguished by the entirely glabrous ovary, nearly glabrous calyx-tube, and glabrous stems and peduncles.

COLUMNEA TOMENTULOSA MORTON—BOCAS DEL TORO: Río Cricamola, between Finca St. Louis and Konkintoë, alt. 10–50 m., Aug. 12, 1938, *Woodson, Allen & Seibert 1876*. Previously known from Nicaragua and Costa Rica.

COLUMNEA **panamensis** Morton, sp. nov. *Eucolumnea*. Frutex epiphyticus parce ramosus, caule subtereti parce strigoso ca. 8 mm. diam., ramulis brevibus, dense antrorse strigosis; folia opposita aequalia, breviter petiolata, petiolo ca. 4 mm. longo, strigoso-hirtello; lamina foliorum elliptica vel anguste elliptica, 4–4.5 cm. longa et 1.5–1.9 cm. lata, vix acuta, basi cuneata, chartacea, integra, utrinque dense strigoso-pilosa, immaculata, venis primariis 4-jugis; flores adscendentes solitarii axillares, pedicello 1.5 cm. longo, dense albido-tomentoso; calycis lobi liberi, lineari-oblongi, ca. 1.5 cm. longi, 4 mm. lati, acuti, basi angustati, integri, utrinque pilosi; corolla coccinea, 6.5–7 cm. longa, in calyce suberecta, basi postice gibbosa, tubo ca. 3 cm. longo, basi ca. 4 mm. lato, sursum ampliato sed non ventricosus, in fauce 10–11 mm. lato, non contracto, externe piloso, limbo valde bilabiato, galea erecta integra, 3–3.5 cm. longa, apicem versus ca. 1.4 cm. lata, lobis lateralibus cum galea alte connatis (1.8–2 cm.), partibus liberis deltoideis acutis, inferiore patente, lineari-oblongo, 1.5–1.7 cm. longo; filamenta pilosula, apice recurvata; antherae quadratim connatae, mox liberae, 2.6 mm. longae, 2.4 mm. latae, glabrae, loculis oblongis; ovarium dense albo-villosum; stylus elongatus pilosulus; stigma stomatomorphum; disci glandula crassa emarginata, ca. 2.3 mm. longa et 2.2 mm. lata, glabra.—CHIRIQUÍ:

vicinity of Casita Alta, Volcán de Chiriquí, alt. 1500–2000 m., June 28–July 2, 1938, *Woodson, Allen & Seibert 860* (Herb. Missouri Bot. Garden, TYPE).

Perhaps allied to *C. microcalyx* Hanst., of Costa Rica, but distinguished by the larger, longer-petiolate leaves, the different pubescence of the leaves, pedicels and calyx lobes, more deeply cleft corolla, and especially by the puberulous filaments.

RUBIACEAE

(*P. C. Standley, Chicago*)

**RUDGEA isthmensis** Standl., sp. nov. Arbuscula 4-metralis ut videtur omnino glabra (flores non visi), ramis gracilibus viridibus teretibus, internodiis valde elongatis; stipulae deciduae, non visae, basi intus setis numerosis incrassatis corneis pallidis ca. 2 mm. longis persistentibus auctae; folia mediocria breviter petiolata chartacea, petiolo crassiusculo 8–11 mm. longo; lamina ovata vel oblongo-ovata 12–14 cm. longa 5–7.5 cm. lata anguste longiacuminata, basi obtusa vel rotundata atque breviter contracta, supra opaca viridis, nervis venisque prominulis, subtus fere concolor subflavescens, costa elevata, nervis lateralibus utroque latere ca. 8 prominentibus angulo latiusculo adscendentibus subarcuatis remote a margine conjunctis, venulis prominulis laxe reticulatis, axillis nervorum lateraliū poro magno domatiatis; inflorescentia terminalis parva cymoso-paniculata ca. 2.5 cm. longa et 3 cm. lata pauciflora 18 mm. longe pedunculata, ramis primariis basi non bracteatis, infimis divaricatis rigidis, floribus sessilibus; fructus late ovalis 1 cm. longus 8 mm. latus, pyrenis dorso grosse obtuse costatis.—CANAL ZONE: vicinity of Salamanca Hydrographic Station, Río Pequení, alt. 80 m., July 28–29, 1938, *Woodson, Allen & Seibert 1618* (Herb. Field Mus., TYPE; duplicate in Herb. Missouri Bot. Garden).

The only other species of *Rudgea* previously known from the region, *R. cornifolia* (Humb. & Bonpl.) Standl. (*R. fimbriata* Standl.) has practically sessile leaves. In *R. isthmensis* the remains of the calyx persistent upon the fruit show that the calyx is barely 0.5 mm. in height and remotely denticulate.

## CAPRIFOLIACEAE

VIBURNUM STELLATO-TOMENTOSUM (Oerst.) Hemsl.—CHIRIQUÍ: thickets between Finca Lérída and Boquete, ca. 1300–1700 m., July 8–10, 1938, *Woodson, Allen & Seibert 1103*. This species, apparently rather frequent in Costa Rica, has previously been unrecorded from Panama.

## CUCURBITACEAE

CUCURBITACEA sp. We have been unable to place this specimen either to genus or to species. Our material consists of a rather slender, scandent herb; stems essentially glabrous; leaves ovate, broadly cordate, acutely acuminate, 12–13 cm. long, 10–11 cm. broad, membranaceous, minutely and sparsely bullate, otherwise glabrous, the petioles very slender, 4 cm. long, glabrous; tendrils opposite the leaves; staminate inflorescences spicate-paniculate, in some cases with as many as 6 slender branches 15–30 cm. long, bearing occasional reduced tendrils interspersed amongst the distant, nearly sessile floral clusters; staminate flowers greenish-yellow, pedicel 1 mm. long; calyx-lobes 5, equal, broadly ovate, 2.5 mm. long; corolla a fleshy, entire, disc-like ring 0.5 mm. deep, adnate to the base of the calyx; staminal column slender, 1 mm. long, anthers sessile, 5, sigmoid. Since pistillate flowers and fruit are lacking, it is scarcely possible to refer the material to either a new or a pre-existing genus.—BOCAS DEL TORO: vicinity of Nievecita, alt. ca. 0–50 m., Aug. 8–19, 1938, *Woodson, Allen & Seibert 1841* (unicate, in Herb. Missouri Bot. Garden).

## COMPOSITAE

(*S. F. Blake, Washington; Senecio by J. M. Greenman, St. Louis*)

SENECIO COOPERI Greenm.—CHIRIQUÍ: Bajo Mona, mouth of Quebrada Chiquero, along Río Caldera, alt. 1500–2000 m., July 3, 1938, *Woodson, Allen & Seibert 1014*. Previously known only from the highlands of Costa Rica.

LAGENOPHORA **panamensis** Blake, sp. nov. (pl. 23). Herba perennis pumila pluricaulis; caules adscendentes ca. 1 dm. alti sparsissime pubescentes usque ad capitula foliosi; folia basalia spathulata v. oblanceolata ca. 5 cm. longa obtusa penni-

nervia subcoriacea, lamina crenato-serrata breviter ciliata caeterum subglabra in petiolum subaequalem late marginatum sparse ciliatum angustata; folia caulina ca. 9–14 internodiis saepius longiora, inferiora basalibus similia sed breviora, media et superiora linearia sessilia sparse ciliata prope apicem crenato-serrata, suprema integra; capitula 2–3 parva radiata terminalia et in axillis supremis, pedunculis dense adscendenti-pilosulis quam foliis subtendentibus brevioribus; involucri ca. 4 mm. alti 3-seriati paullum gradati appressi, phyllaria lineari-oblonga obtusa tenuiter subherbacea angustissime subscarioso-marginata 1-nervia infra ciliata supra ciliolata; radii numerosi patentes parvi lavendulacei; corollae disci flavae (?); achenia radii obovata margine crasse nervata breviter rostrata, rostro dense sessili-glanduloso; achenia disci similia, rostro brevissimo annulari; pappus nullus.

Plant apparently caespitose; rootstock oblique, about 4 mm. thick; stems several, greenish, subterete, few-ribbed, essentially glabrous below, above sparsely puberulous and with scattered long hairs, leafy throughout; basal leaves few, about 5 cm. long including petiole, the blade 2–2.8 cm. long, 10–12 mm. wide, crenate-serrate throughout (teeth 5–8 pairs, rather crowded, 1–3 mm. long, obtusely callous-pointed at the rounded apex, occasionally 1-toothed on the side), short-pilose-ciliate, narrowed into the petiole, this sparsely pilose-ciliate with longer hairs especially toward base; middle stem leaves 1.5–2.5 cm. long, 3–5 mm. wide, sparsely pilose-ciliate with many-celled hairs, toward apex crenate-serrate or serrate with 1–4 pairs of obtuse or acute teeth; peduncles about 5 mm. long; heads (moistened) 12.5 mm. wide; disk (moistened) about 8 mm. wide, 4 mm. high; involucre flattish-hemispheric, about 9 mm. wide, 4 mm. high, the phyllaries 0.6–0.8 mm. wide, sometimes purplish-tinged above, sparsely pilose-ciliate toward base, more densely ciliolate toward tip with sometimes subglandular hairs, otherwise glabrous; disk flattish, naked; rays about 57, spreading, 2-seriate, fertile, “pale pink-lavender,” glabrous, the tube 0.3 mm. long, the lamina narrowly oblong or linear-elliptic, 2-dentate or 3-denticulate, 2–3-nerved, 2.6–2.8

mm. long, 0.6–1 mm. wide; disk flowers about 28, apparently mostly sterile but some perhaps fertile, their corollas glabrous, 2.2–2.5 mm. long (tube 0.6–0.8 mm., throat campanulate, 0.7–0.9 mm., teeth 5, ovate, acute, spreading, 0.8 mm. long); ray achenes (immature) obovate, compressed, thick-nerved on the margin, nerveless on sides, 2.2 mm. long including beak, abruptly or gradually narrowed into a short thick densely sessile-glandular neck 0.4 mm. long, otherwise glabrous, epappose; disk achenes (immature) obovate, compressed, thick-nerved on margin, nerveless on the sides, 2 mm. long, 0.7–0.8 mm. wide, slightly narrowed at apex and then slightly expanded into a ring-like usually densely sessile-glandular neck about 0.1 mm. high; style branches of hermaphrodite flowers lance-oblong, acute, hispidulous throughout dorsally, without stigmatic lines.—CHIRIQUÍ: on potrero, Loma Larga to summit, Volcán de Chiriquí, alt. 2500–3380 m., July 4–6, 1938, Woodson, Allen & Seibert 1047 (U. S. National Herb., no. 1,746,842, TYPE).

The discovery of a species of *Lagenophora* on the highest mountain in Panama is of considerable phytogeographic interest. *Lagenophora*, a genus of Astereae containing about twenty-three species, has its center of distribution in the Australian region. Seven species are found in New Zealand and outlying islands, and four others in Australia, one of which occurs also in Ceylon, eastern India, Hongkong, Java, Sumatra, and the Philippines. Three species have been described from the Hawaiian Islands, two from the Liukiu Islands, and one each from Borneo, New Caledonia, and the Fiji Islands. The half dozen proposed species from South America reduce to three, *L. harioti* Franch., *L. hirsuta* Less., and *L. nudicaulis* (Lam.) Dusén (*L. commersonii* Cass.), which range from central Chile (Rancagua) to Tierra del Fuego, one of them occurring also on Tristan da Cunha. *L. purpurascens* Phil. is reduced to *L. nudicaulis* by Reiche, and *L. lechleri* and *L. muscicola*, both *nomina nuda* made by Schultz Bipontinus, are equivalent to *Laestadia lechleri* and *L. muscicola* of Weddell.

The three South American species are all scapose or essen-

tially so and quite different in appearance from *L. panamensis*. Of the some fourteen species available for comparison, the Hawaiian *L. mauiensis* Mann is most similar in appearance to *L. panamensis*, but the former is readily distinguished by its serrate rather than crenate leaves, its glandular-pubescent stem, and its much larger solitary heads.

*SABAZIA TRIANGULARIS* var. **papposa** Blake, var. nov. Achenia radii glabra epapposa vel interdum squamellam unicam oblongam fimbriatam 0.6 mm. longam angulo interno gerentia; achenia disci erecto-hirsutula papposa; pappi squamellae 5-6 1-seriatae oblongae obtusae fimbriatae 0.8 mm. longae tubam corollae aequantes.—CHIRIQUÍ: Loma Larga to summit, Volcán de Chiriquí, alt. 2500-3380 m., July 4-6, 1938, *Woodson, Allen & Seibert 1055* (U. S. National Herb., no. 1,746,843, TYPE).

In the type of *Sabazia triangularis* Blake (*Pittier 3109*, El Potrero Camp, Volcán de Chiriquí, alt. 2800-3000 m.) the ray achenes are glabrous and epappose, the disk achenes hispidulous and likewise epappose. The differences between the typical form and the variety are much like those separating *Sabazia pinetorum* Blake and its var. *dispar*.

*PIQUERIA TRINERVIA* Cav. var. **LUXURIANS** Kuntze—CHIRIQUÍ: Loma Larga to summit, Volcán de Chiriquí, alt. 2500-3380 m., July 4-6, 1938, *Woodson, Allen & Seibert 1044*. Apparently the first record for any form of the genus in Panama. The variety was previously known from Costa Rica; the typical form ranges from Mexico to Costa Rica, and is also recorded by Robinson from Haiti.

## EXPLANATION OF PLATE

PLATE 20

*Vriesia Woodsoniana* L. B. Smith





W. WOODSON, B. SEIBERT, GEORGE ENGELMANN  
 HERBARIUM OF THE UNIVERSITY OF CALIFORNIA  
 PLANTS OF PANAMA  
 AND OTHER SPECIES

1939

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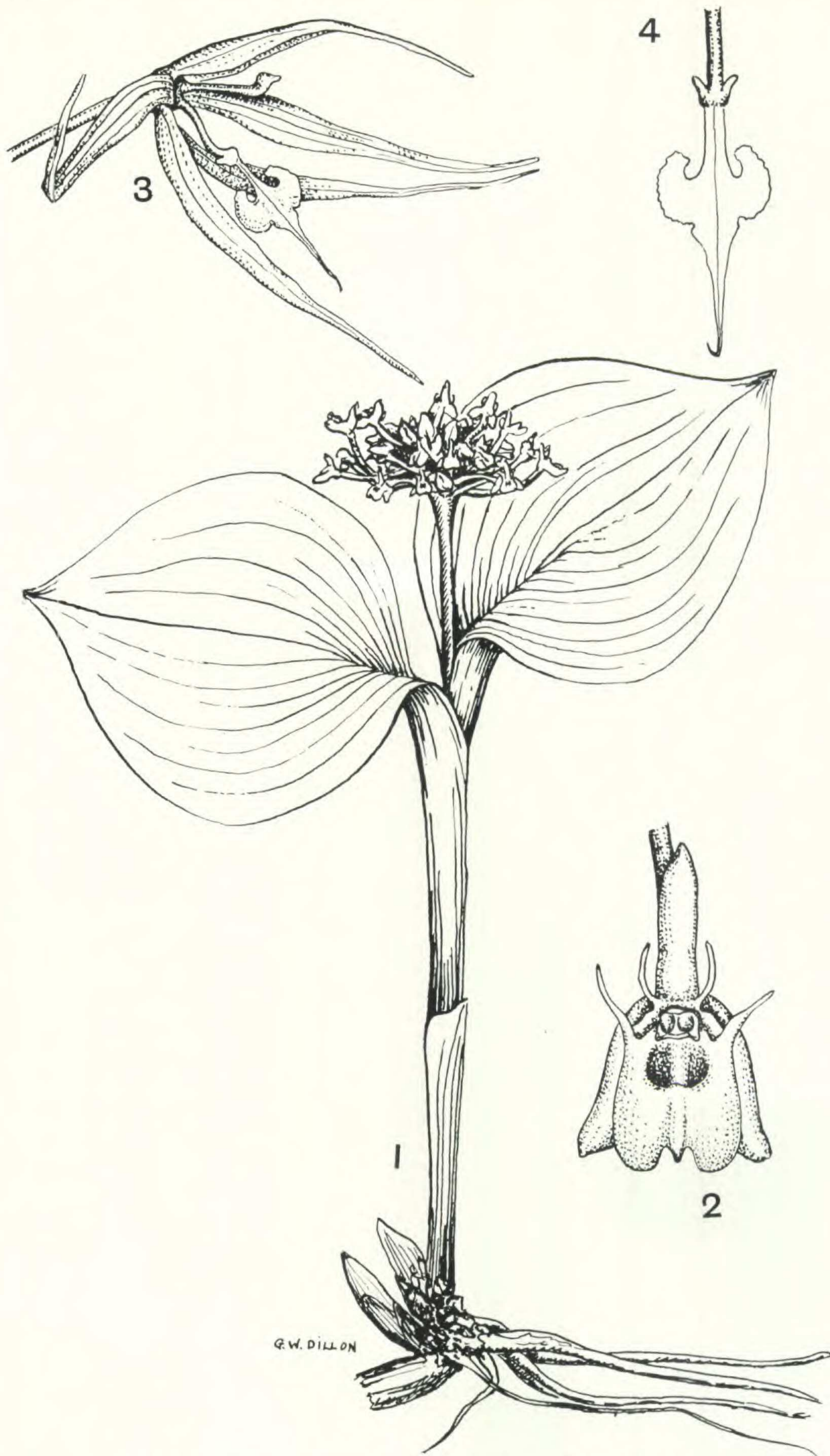
WOODSON AND SEIBERT—FLORA OF PANAMA

## EXPLANATION OF PLATE

## PLATE 21

1. *Malaxis Woodsonii*. Plant natural size.
2. *Malaxis Woodsonii*. Flower  $\times 5$ .
3. *Notylia Cordesii*. Flower  $\times 4$ .
4. *Notylia Cordesii*. Labellum  $\times 8$ .

(Figures drawn from the types by G. W. Dillon.)



WOODSON AND SEIBERT—FLORA OF PANAMA

## EXPLANATION OF PLATE

## PLATE 22

*Maytenus Woodsoni* Lundell. From type specimen, *Woodson, Allen and Seibert 1065*, in Herbarium of the University of Michigan.  $\times \frac{1}{2}$ .